Integration of Pedagogical, Andragogical, and Heutagogical (PAH) Approaches in Learner Support in MOOCs: An Action Research

MOOC の学習者支援におけるペダゴジー的、アンドラゴジー的、およびヒュータゴジー的（PAH）アプローチの統合：アクションリサーチ

A Dissertation Presented to
the Graduate School of Art and Sciences,
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国際基督教大学 大学院

アーツ・サイエンス研究科提出博士論文

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Chapter 1 Introduction

This chapter starts by providing an overview of current research on learner support and how current research affects learner-related factors such as engagement, motivation, satisfaction, creativity, and other general learning outcomes of students in MOOCs. Then it is followed by an introduction to the main purpose and research questions employed in this study, along with the research study's significance to the field of online education and education technology. Finally, the chapter concludes by outlining the issues that are addressed by the research.

Background of the Study

Open and Distance Learning

As technology and technology use in open and distance learning (ODL) continues to evolve, improve, and become more ubiquitous and accessible, opportunities and options have been accorded to students, reaching more people, and utilizing more platforms. ODL has provided learners with an opportunity to study in their own time, at the place of their choice, and without face-to-face contact with a teacher (Bates, 2005). It has likewise accorded learners the opportunity to pursue their dreams of obtaining a degree and learning new information for their knowledge or even development and growth at work. Moreover, it also has opened access to education to those who normally cannot do so due to lack of finances or distance from the institution. The distance factor is further supported by Ally (2008) stressing that many organizations are adopting online learning, then the most

popular form of ODL, as an option in training employees or providing refresher services for their employees because online learning has many benefits for both learners and instructors. Whether it is asynchronous or synchronous learning, the learners can benefit from online learning by going over the materials in asynchronous mode or by real-time interaction with fellow students and instructor/s via synchronous mode, and related to the previous reason, by having lifelong learning opportunities. Several studies have revealed that one of the top motivations for pursuing online learning is for additional knowledge, whether in work or just self-improvement.

In the mid-1990s, several authors have already recognized a potential growth and a boom in the field of ODL and Open and Distance Education (ODE). One of the early and prominent authors in ODE, Sir John Daniel, already recognized a so-called second revolution, i.e., spurred by continuing growth in the demand for education, especially among adults, teaching and training institutions of all types are exploring the and adopting the methods of open and distance learning. Similarly, Hawkridge (1995) enumerated reasons for thinking that distance education can expand exponentially. Some of these reasons include a comparison of old and new media for distance education, particularly its capacity to support two-way communication, which aids learning; access and costs issues; capitalistic threats brought about by multinational companies; and the attempts of the Open University to create a big bang for its students. This foreseen exponential expansion has happened and can still be seen happening. These changes,

mainly focusing on the improvements in technology such as rapid Internet, networked and connected environment, database-assisted learning, and Web 2.0 have allowed the proliferation of online learning and various platforms exist.

The term ODL was given various definitions and descriptions. One was given by Moore, Tait, Resta, Rumble, and Zaparovanny (2002) emphasized that all or most of the teaching is conducted by some provider removed in time and space from the learner, and the belief that open access to knowledge is critical for development and the creation of a free and open society. The early UN report on Open and Distance Learning (2002) likened (open) and distance learning to distance education. It further stressed that the use of the word open was intended to highlight this key feature of the theory and practice of distance education (UN, 2002). This line was somewhat reflective of how Melton viewed ODL. He (2002) looked at its aims and presented two groups of aims that educator in ODL typically attribute their approaches to: opening access to education and responding to student needs. The former, opening access to education, refers to "opening up opportunities for students to learn whatever they want to learn, wherever they may be." The latter, responding to student needs, refers to "a reflection on the extent to which related approaches emphasize the student-centered nature of ODL." Bates (2005) recognized that it was likened and built around the geographical, social, and time constraints of individual learners; however, he viewed its concept more as an educational policy, that is, "a provision of learning in a flexible manner" focusing more on the learners. Lastly, the

intergovernmental arm of the Commonwealth of Nations, the Commonwealth of Learning (COL) (2008) defined ODL as "a system of teaching and learning characterized by separation of teacher and learner in time and place"; uses multiple media for delivery of instruction; involves two-way communication and occasional face-to-face meeting for tutorials and learner-learner interaction."

Emergence of Massive Open Online Courses

As ODL continues to open its doors to so many learners, educators, and practitioners alike, have explored various ways to reach more learners, especially those who have limited, if none, access to educational resources. One of the breakthroughs in the field of ODL is massive open online courses (MOOCs). While there have been many innovations in the field of educational technology over the decades, by far the most prominent public discussion in mainstream media has been given to the phenomenon of MOOCs (Kovanovic, et al, 2015). More than a decade old and considered by some as a disruptive technology and innovation, MOOCs continue to encourage educators and traditional institutions to rethink and even bring reform to higher education (Billington & Fromueller, 2013; Christensen & Eyring, 2011; Dyer, 2014). Despite this critique, MOOCs have challenged many educators into reflecting and rethinking the way they design, implement, and evaluate their courses.

Since the first introduction of MOOCs in 2008 through the initiative of then a University of Manitoba professor, George Siemens, and a philosopher and commentator,

Stephen Downes (Baturay, 2015), MOOCs have been one of the most discussed innovations in the field of distance education. MOOCs are providing opportunities for thousands of learners to participate in free higher education courses online (Yousef, Chatti, Wosnitza, & Schroeder, 2015). However, it came into the limelight with the New York Times publication dubbing the year 2012 as the year of the MOOCs. It was rightly so as that year became pivotal (in the field of MOOCs) as prestigious universities like Harvard, MIT, and Stanford examined and explored MOOCs' capabilities. In only a few years, MOOCs have received tremendous coverage in mainstream media, traditional academic conferences and journals, blogs, and social media (Siemens, 2015). The MOOCs have likewise been introduced and actively used in several countries and across various regions. Outside of North America, the Chinese have been among the most active adopters of MOOCs (Zhang, Perris, Zheng, & Chen, 2015). Apart from China, India has likewise made its way into the global leader list as its top provider, Swayan has one of the largest rosters of registered students' MOOCs programs worldwide. In addition, more providers in other countries are offering more MOOCs; apart from the usual MOOCs in Spain, Germany, and Italy, France is now following suit. In addition, Latin America has very recently joined the MOOC movement, greatly increasing its production of courses during 2015 (Sanagustin, Maldonado, & Morales, 2016) and introduced in several countries across various regions. With the covid-19 pandemic, the waning coverage of MOOCs has suddenly made thousands of researchers, educators, and educational institutions team up

with MOOC providers in designing courses online to meet the shift to emergency remote learning.

Studies on MOOCs

In its early stages, most of the studies focused more on its criticisms of high enrollment, and dropout rates and completion rates (Jordan, 2014; Schmoller, 2013; Sharma, 2013). In addition, many explored its effectiveness (Hone, 2016; Lay Huah, 2016). Some authors painstakingly analyzed and examined various research studies and literature on MOOCs. Initial studies on MOOCs focused on learners' perspectives, behaviors, and participation patterns (Liyanagunawardena, Adams, & Williams, 2013 cited by Anders, 2015).

Later studies of MOOCs have also looked at the learners' experience and attitude towards MOOCs. acceptance by students and how it affects their desire to continue studying the MOOC (Zhou, 2016), and how it can be improved from the learners' point of view in terms of coping styles and methods (Zhang, 2016), and communication preferences among learners (Zhang, Peck, Hristova, Jablokow, Hoffman, Park, and Bayeck, 2016) to name a few. Recent studies on MOOCs have shown MOOCs have been growing in popularity with educational researchers, instructors, and learners in online environments (Koutropoulos, Gallagher, Abajian, deWaard, Hogue, Keskin, and Rodriguez, 2012) and how MOOCs are being presented in the news (Kovanovic, Joksimovic, Gasevic, Siemens, & Hatala, 2015). Other more recent studies explored

motivations and perspectives when enrolled in MOOCs (Yousef, Chatti, Wosnitza, & Schroeder, 2015), accreditation (Pundak, Sabag, & Trotskovsky, 2014), value and cost (Baker & Passmore, 2016), ethical considerations (Marshall, 2014), and economic sustainability (Rodriguez, 2012; Liyanagunawardena et.al, 2015). Other studies have focused on its quality (Ossiannilsson, Altinay, & Altinay, 2015) and other pedagogical concerns including methods in relation to its impact not just on pedagogical theory but on educational institutions (Raffaghelli, Cucchiara, & Persico, 2015). Similarly, some studies have investigated on pedagogical implications brought about by technological concerns (Kellogg & Edelman, 2015) and other studies have explored learner-related topics such as emotive vocabulary and language of participants (Koutropoulos, A., 2012) as it pertains to learning processes and pedagogical issues. From then on, studies on MOOCs have expanded to better understanding and appreciation of the application of MOOCs in a digital learning environment based on existing and emerging theories of learning and technology. Finally, several studies have examined the psychological perspective and implications to learning specifically learners and learners' behavior (Terras & Ramsay, 2015).

With such a diverse list of studies exploring MOOCs, several authors have conducted systematic reviews on MOOC studies through the years. These review studies have analyzed the trends found in publications and literature on MOOCs. One of the most widely referenced and exhaustive analyses was done by Liyanagunawardena, Lundqvist,

and Williams (2015) through a systematic study of the published and peer-reviewed literature on MOOCs from 2008 to 2012. They aim to examine developing research areas, methods being applied, and topics that seem to be lacking in research. Their analysis revealed that MOOC studies have been consistently and steadily increasing since 2008. The results also revealed that this literature may be categorized into eight themes. These are 1) introductory; 2) concept; 3) case studies; 4) educational theory; 5) technology; 6) participant-focused; 7) provider-focused; and 8) others. Furthermore, the results revealed that MOOCs had "created a wide interest as a change agent in higher education and although the articles about it have been growing, it is still limited." Hence, a recommendation to increase that more studies be done in areas such as creator/facilitator perspective and technological aspect. Apart from that, interesting venues for future research that the study suggested being explored are cultural tensions within courses and ethical aspects of using data generated by MOOC participants. Similarly, MOOCs have also shown their strength when used in the 'conventional' manner. Israel (2015), in her systematic review of MOOC use in classroom settings, has revealed that MOOCs show substantial promise in traditional college settings. Furthermore, Israel (2015) specified these into two: 1) as learning resources and, 2) as a new teaching environment. MOOCs also have several advantages: by design, they are incredibly flexible, diverse in their range of subjects, open to anyone, and free (Ossiannilsson, Altinay, & Altinay, 2015).

The study of Zawacki-Richter, Bozkurt, Alturki, and Aldraiweesh (2018) used a text-

mining tool in reviewing 362 empirical articles and found that literature on MOOCs generally focused on four lines of research: a) the potential and challenges of MOOCs for universities; b) MOOC platforms; c) learners and content in MOOCs; and d) the quality of MOOCs and instructional design issues. Recently, Rasheed, Kamsin, Abdullah, Zakari and Haruna (2019) also did a systematic mapping of empirical MOOC literature. Their study specifically answered research-related queries like common research, data collection, and data analysis methods. In addition, the results also revealed the most common focus of MOOC studies, usual research topics, their contribution to the field, and usual channels they are being published. Using Petersen's systematic mapping study and Kitchenham's systematic literature review as methods, their results confirm previous studies' conclusions that there is a substantial and steady increase in research activities. Most of the studies are from the United States followed by China, Spain, and the United Kingdom.

Statement of the Problem

Over the years and as highlighted in the previous section, studies on ODL and MOOCs have expanded. Previous studies have examined learner profiles and characteristics, types of support being provided to learners, learner motivations, and learner performance; however, despite these studies, one of the lesser focused aspects of MOOCs since its inception has been the support for learners. Zhang & Galvan (2018) posited that the reason for few studies on learner support is the lack of expertise and

exposure in instructional design in online learning. This points to the fact that designing MOOCs, just like designing face-to-face instruction, is based on the interpretation and translation of theories of learning. Learning support should be an integral part of this design. While other aspects looked at learners' enrollment and drop-out rate, few studies have examined how learners are being aptly supported in MOOCs. The absence of the 'physical teacher' in these ODL settings has distributed the responsibility of learning to the support materials. In more traditional ODL, there are several support system frameworks describing how learner support can be provided but in MOOCs, there still exists a gap in a guided framework for learner support utilizing specific learner approaches.

As early as 2000, respected institutions like the US-based National Education Association (NEA) have already released an online learning benchmark to succeed in online learning. The benchmark stated six aspects: institutional, course design and development, teaching and learning, course structure, student support, and faculty support. Learner support has been recognized as a significant part of online learning or Internet-based education. Over the years, the concept of learner support, its models, and its various stages have been explored by several authors in distance education and online learning mode. They have recognized the importance of the learner and his/her needs (Tait, 1995), early studies like Stacey and Dunlap (2003) have already explored learning strategies to improve learner support services to the students. They likewise stressed

that learner support is a critical component of an effective learner retention program among online students. Similarly, several authors have also recognized the positive effects of learner support. Simpson (2005) has emphasized that the so-called distance education deficit may be solved through learner support. Simpson (2015) further pointed out that this support is a backup from the usual teaching material. All in all, learner support has been recognized to be of core importance (Gao, 2012) and a cardinal feature of open and distance learning (Agrawal & Ghosh, 2014), and ultimately crucial in ensuring learner success among open and distance learners (Phineas, 2012).

Recognizing the importance of learner support, especially in the MOOC setting, is an essential component for an effective learning environment (Bates, 2014) and can lead to positive learner-related factors like motivation and pedagogy (Contact North, 2016) and learning outcomes like completion rate (Gregori et al.,2018). Although learner support has fervently been recognized as significant in any type of distance learning, there have been limited studies that explored specific functions and structures of learner support, especially in MOOC learning environments. Previous studies on learner support in MOOCs have been mostly descriptive and focused on the MOOC learners' demographics, enrollment and attrition rates, and other more holistic perspectives on learner support. Not many experimental or action research-based studies have been conducted on MOOC learning in general and learner support in specific.

Previous literature and studies on learner support in online learning in general (e.g., Luckin et al., 2010) have provided the beginnings of a learner-generated framework to support the effective use of technology in learning. Similarly, other authors like Jansen et al (2016), Blaschke (2016), and Agonacs (2017) have all examined and presented possible design frameworks for learner support in an ODL mode. Cochrane (2014) has expanded the concept of the PAH framework and then explored using technological platforms as a catalyst for pedagogical change. His succeeding studies have utilized various theories including the pedagogical, andragogical, and heutagogical (PAH) approach in developing a framework for creative pedagogies. Pedagogical approaches refer to

These previous studies on learner support in online learning is informative and useful to understand and design learner supports in MOOCs, but due to unique features of MOOC learners like relatively more mature and independent learners, self-paced, and generally, self-autonomous individuals (Anders, 2015; Blaschke, 2012). Moreover, these studies have some limitations in applying to the MOOC settings as they tend to focus only one learning approach, for example, andragogy or heutagogy only or an overview of pedagogical aspects, ignoring the fact that MOOC learners need supports for all these aspects. But little has been written on an integration of all these three concepts pedagogy, andragogy, and heutagogy, in the PAH continuum in providing learner support in MOOCs. These concepts will be further discussed in Chapter 2.

Purpose of the Study

The purpose of the research was to investigate learning support systems in the context of MOOCs adopting the pedagogical, andragogical, and heutagogical (PAH) continuum as a conceptual framework for the study, and develop a model for learner support for MOOCs. Specifically, To address research gaps in learner support in MOOCs and other related literature, this research asked the following questions adopting the conceptual framework presented

above.

1. What are the existing learner support systems in MOOCs? (a. Which of the following fall under pedagogical, andragogical, and heutagogical approaches? b. What is/are the common approaches being used in MOOCs? What are the essential features and factors to be considered in learner support for MOOCs following the PAH approaches?
2. What are the essential features and factors to be considered in learner support for MOOCs following the integration of PAH approaches?
3. How efficient and effective are the PAH integrated and designed learning support systems for the MOOC learners?
4. Which features of the integrated pedagogical, andragogical, and heutagogical (PAH) approaches are effective in supporting a MOOC learner?

To achieve this research purpose, three interrelated studies were carried out using Mills' action research model. Study One (pilot study) was carried out to identify the existing learner support system in MOOCs using an analysis of selected MOOCs and then an expert review. Study Two was then conducted to find out whether these existing learner support systems exist. Study Three, comprised of two phases, was conducted to find out the essential features and factors to be considered in learner support for MOOCs and how effective and efficient these are for MOOC learners. More details on the research questions (Chapter 2) and research design (Chapter 3) will be provided. The research explored how the integration of PAH approaches in providing learner support for MOOCs affects various learner-related factors like engagement, motivation, and completion, to name a few. Using Mills' action research model, it compared whether the pedagogical and andragogical approaches had more impact versus PAH-integrated approaches. It then incorporated all the results into creating a learner support framework for MOOCs. Finally, based on its main findings, it discussed how the proper design and rigorous implementation of learner support approaches can provide positive on learners and learner-related factors and be able to use these findings in designing and developing a model for learner support in MOOCs.

Significance of the Study

This study is of particular significance in the theoretical domain of online learning in general and learner support in MOOCs. First, the research provides a developed

conceptual model of a MOOC learner support model which will be able to provide a better guide to a more effective MOOC learning environment. The model integrates the PAH approaches and identifies various factors affecting MOOC learners and learner support. Second, it is one of the first studies that attempted to develop the integration of PAH approaches in providing learner support in MOOCs as action research. Furthermore, the study attempts to explain the relationships between learner support and other learning variables. Finally, the study provides a set of learner support strategies on the PAH approaches to help current and future MOOC practitioners, instructors, and course developers design and provide learner support accordingly.

Definitions of Key Terms and Abbreviations

Andragogical Approach – also described as self-directed learning, expects the teachers to be mentors or guides. This approach allows the learners to find and explore answers to activities given to them. This approach can usually be seen in higher education levels (universities).

Heutagogical Approach – also described as self-determined learning, encourages students to find their problems and questions. The teacher in this case aids by providing feedback on the context of the learner's learning journey and may suggest activities and/or subjects to explore.

Open and Distance Learning – "a system of teaching and learning characterized by separation of teacher and learner in time and place"; uses multiple media for delivery of

instruction; involves two-way communication and occasional face-to-face meeting for tutorials and learner-learner interaction." (COL, 2008)

MOOC Massive Open Online Courses – courses that can accommodate a large student body at any given time and are open for free to anyone willing to participate and have internet. These organized courses are conducted online through interactive tools such as videos, presentations, and audio. Typical assessments are quizzes and exams. There is also an interaction between students and teachers in one form or another.

Pedagogical Approach – also described as teacher-led learning, requires the teachers to determine what students will learn and how they will learn it. This approach can usually be seen in basic education levels of 'traditional' classroom settings as teachers build the knowledge base of their students.

Commonly Used Abbreviations

MOOC – Massive Open Online Courses

ODL - Open and Distance Learning

DE – Distance Education

CCT – Concept Construct Theme

PA – Pedagogy-Andragogy

PAH – Pedagogy-Andragogy-Heutagogy

Chapter 2: Literature Review

Review of Literature

This chapter reviews the literature on the development of the learner support system as an integral part of MOOCs. The discussion is done within the background of the existing and emerging theories of learning which informs the design and delivery of a more effective learning environment. The chapter begins by introducing the key events and concepts in the development of MOOCs from the different generations of open and distance learning (ODL). This is followed by online and distance learning focused on e-learning and then MOOCs vis-à-vis its different types according to the learning theories and approaches embedded in its design. The discussion on how the learning theories (behaviorism, cognitivism, constructivism, connectivism, and humanism) as well as pedagogical, andragogical, and heutagogical approaches including previous empirical studies influence the learner support system of MOOCs.

Open and Distance Learning

Open and distance learning (ODL) or interchangeably called distance education, open and distance education or distance learning is traditionally defined as, any educational or learning procedure in which the teacher/educator and the student/learner are separated geographically. In the early ODL modes, the learners did or could not directly see nor immediately interact with the teacher or with their classmates. In such modes, transmission of knowledge started with print materials delivered through the postal

system, then through radio and television. Today, the main mode of ODL is advanced technology such as the Internet. Due to the nature of ODL being highly influenced, if not dictated, by its form of delivery, it was quite common to find many authors and researchers describing the progress of ODL through technology. But perhaps one of the more popular ones was the one presented and constantly modified model by Moore and Kearsley (1996), which through time have examined distance education through its dominant technology lens. On the other hand, Anderson and Dron (2011) looked at distance education through its dominant pedagogy. Lastly, Evans, Haughey, and Murphy (2008), reviewed distance education through its organizational models.

Distance education has gone through many phases, and at each phase, different technologies and delivery media have been used with each instructional media (Moore & Kearsley, 2012). Several other authors described these various phases into generations highlighting specific technology and programs developed. Depending on the authors, these generations vary in number, but all described the progression and development, as well as the dominant technology used in various periods of distance education. From the first generation, also described as correspondence education, to fifth generation, the latest stage in distance education witnessed the existence of ubiquitous devices providing access to many learners. Moreover, it also saw the arrival of newer and faster technologies including computers, Internet, and satellite technologies that paved the way for more ways of providing education to everyone. Electronic learning (e-learning) is one of the products of

this generation. It highly utilized resources like the Internet and other accessible devices to provide greater interaction among participants. The main concern during this period was the limitation of learners' knowledge in using these devices. With these devices and various platforms made available, several educators and researchers have explored and pushed the idea of distance education further and bigger. The concepts of ODL have become buzzwords in the mid-1990s to early 2000s.

Apart from technology, lesser 'generations' were likewise studied by other authors. Distance education was also examined by its pedagogy. Anderson and Dron (2011) argued that there are three generations of DE, in terms of pedagogy. Unlike the previous discussion i.e., focusing on technology, the paper by Anderson and Dron looked at learning experiences built in with the design. Using the community of inquiry model and specifically looking at social, cognitive, and teaching presence, the authors were able to identify three generations of DE: cognitive-behaviorist, social constructivist, and connectivist pedagogies. Distance education was examined through the lens of its dominant pedagogy for each generation (Garrison, 1999; Lauzon & Moore, 1989; Taylor, 1999 & 2001; Moore and Kearsley, 2005).

The third means by which distance education was also examined was through its organizational models. Distance education is governed by similar education principles used in face-to-face educational set-up; however, distance education has its own set of educational principles that guide the design, implementation and evaluation of programs

using appropriate technology. Nowadays, distance education is influenced a lot by computer and electronics technology. The technology has now made it possible for the teacher/educator and learner/student to connect almost immediately. The study resources can be delivered instantly through various modes like computers, satellites, internet, cable television, interactive video etc.

Bozkurt (2019) managed to bridge distance education in its transition to open and distance learning through his holistic evaluation of the history of distance education. His study aimed to examine DE and ODL from various perspectives to discern its future directions. The results of his traditional narrative review revealed that the history of distance education can be classified under three ages at the macro level and under five generations at the micro level. The three macro levels that Bozkurt recognized are correspondence, visual-auditory, and ICT-based/computer-based distance education. In addition, the five generations he mentioned were similar with previous studies highlighting the technological aspect of distance education. However, what he uniquely pointed out in his study was the various ages (macro levels) that seem to have highlighted related skills and mode for each age. Similarly, he also presented various definitions presented on distance education, open access, and open learning. As technology, learning needs and styles, and learning expectations continue to change, various educational providers have adapted different models to be able to meet these demands. One of these is being able to provide massive open online courses (MOOCs).

Distance education has significant contributions to human resource development in the society. Many have taken advantage of the benefits of developing competence to become economically productive and professionally adept. With its continuously evolving forms due to technological advances and emerging learning theories. Educators and researchers are more mindful of how distance education can be more effective as informed by current theories. Among the new forms are open distance learning and MOOCs, which are undergoing improvement. MOOCs have gained attention globally especially researchers and academics. Research on MOOCs are on the evaluation and experiences on MOOCs but wanting on studies on the elements of MOOCs that defines their effectiveness.

Massive Open Online Courses

It began in 2008 when Canadian scholars, Stephen Downes and George Siemens, developed and offered the course, “Connectivism and Connectivity Knowledge," also known as CCK08, in the University of Manitoba in Canada. The beginning of MOOCs may be traced to the term being coined by another Canadian educator, Dave Cormier, in response to the course. It stands for massive open online courses as an attempt to capture the features of the first MOOC developed. Siemens (2010) presented his definition of MOOCs, “A MOOC is an online course with the option of free and open registration, a publicly shared curriculum, and open-ended outcomes. MOOCs integrate social networking, accessible online resources, and are facilitated by leading practitioners in the

field of study. Most significantly, MOOCs build on the engagement of learners who self-organize their participation according to learning goals, prior knowledge and skills, and common interests." Since its inception in 2008, MOOCs with designs different from the original emerged making Siemens' definition not applicable to them. Nonetheless they share the following common features: massive, open, online, and a course.

History of MOOCs

The non-credit course, CCK 08 launched in 2008 was said to be the first MOOC. In this course, around 25 tuition fee-paying and on-campus students enrolled, and a staggering 2200 students took this for free in the Extended Education of Cormier of Prince Edward University. Cormier (2009) described MOOC as being a course with a start, and end date and that is open with no barriers to entry, neither cost nor education criteria. This MOOC was based on the "connectivist" distributed peer learning model (Baturay, 2014) as such it is referred to as cMOOCs (Downes, 2012). Apart from this, the courses are also online, accessed via Web, and are massive, requiring a significant number of students to contribute to a connected learning environment (Morrison, 2013). The concept of MOOC was also one of the first courses based on the premise of distributed content, where course content is accessed on the Web for free rather than from textbooks.

The CCK08 course had promising objectives and positive outcomes. Its aim was to explore the possibility of interaction between a wide variety of participants and explore the possibility of interaction between a wide variety of participants made possible by

online tools. They intended to provide a richer learning environment than traditional tools including to examine connectivity among learners. This course was highly social in format, experimental, non-linear, and participatory (Pence, 2012). This MOOC utilized many different platforms to engage students with the topic, including Facebook groups, Wiki pages, blogs, forums, and other resources (Marques, 2013). RSS feed was used to distribute and make available course materials. Collaboration tools, blog posts, threaded discussion were avenues for engagement and participation of online students. There was no platform used to host the course. These early courses were then mainly offered to look at the connectivity among learners. From the 2200 participants, 170 of them made blogs. These MOOCs were described to be more creative, dynamic and promote diversity. Moreover, the original cMOOCs are based on long-standing principles of open education and use open educational resources (OER). The content is not created; they use content that is already existing on the web and 'open' and link to it.

On the other hand, Mora (2014) believed that the first MOOCS emerged in 2000, when two initiatives, Fhatom and AllLearn, were developed. Mora claimed that these initiatives had the same characteristics of Coursera and edX. In 2011, another type of MOOCs was also introduced. Stanford University professors Peter Norvig and Sebastien Thurn offered their Introduction to Artificial Intelligence course and a record-breaking 160,000 students from 190 countries signed up online to this course; eventually called xMOOCs (extension), which are quite common nowadays and being offered in popular

sites like edX and Coursera, seem to have adopted a transmission model of instruction. The first MOOCs emerged from the open educational resources (OER) movement (Ossiannilsson, Altinay, and Altinay, 2016). The AI MOOC was followed by two other MOOCs on computer science launched by two other Stanford instructors, Andrew Ng and Daphne Koller, who established Coursera.

The AI MOOC focused more on knowledge being received via video lectures and less on the discussion-based learning promoted by cMOOCs. The common design features of xMOOCs are video lectures, computer-marked assignments, peer assessments, supporting materials for the topics, shared comment/discussion space, no or very light discussion moderation, and badges or certificates after that. Marques (2013) stated that it was only during this time that these courses were considered ‘massive.' It was so massive that Norvig and Thurn eventually created a new business model for online learning, hence the beginning of Udacity.

Despite xMOOCs being anchored on traditional modes, it remains important in evaluating the success of any approach to take account of empirical findings related to learning and self-regulated learning. The year 2012, also witnessed the beginning of other MOOC companies. Two American start-ups, edX, and Coursera were soon established. The company edX was founded by Harvard University and MIT in 2012 to increase access to high-quality education for everyone, everywhere. Computer science professors Andrew Ng and Daphne Koller from Stanford University, on the other hand, founded Coursera. It

partnered with Princeton University, the University of Michigan, and the University of Pennsylvania. Udacity and Coursera use their own specially developed software to allow massive numbers of registrations and a platform for the teaching. These profit companies started partnerships with other leading universities that offered MOOCs to their students using their platforms (Baturay, 2014). Following this development, in 2012, the Massachusetts Institute of Technology (MIT) and Harvard University developed and launched edX, which was also a platform for registration and teaching. It was possible to handle massive enrollments that could reach to as much as 300,000 from several countries. With these breakthroughs, New York Times called 2012 as the Year of the MOOC.

Likened to an Internet startup, MOOCs have allowed anyone who can access their courses to sign up and complete a course. While education has been both open and online, the sizable enrollment numbers associated with massive open online courses (MOOC's) are somewhat unprecedented (Knox, 2014). Open to large audiences, free of charge and accessed online via the Internet, these are the typical characteristics of the growing list of MOOCs. The four-year report done by MIT and Harvard has shown a steady increase in the number of enrollees. In 2019 and prior to the beginning of the covid-19 pandemic, 120 million students signed up for at least one course from about 900+ universities. There were 13,500 courses, 820 micro-credentials, and 50 MOOC-based degrees. Due to the covid-19 pandemic, in 2020, these numbers have dramatically increased. One hundred eighty million

students signed up for at least one course from about 950 universities. There were 16,300 courses, 1180 micro-credentials, and 67 MOOC-based degrees. Based on registration count, the top four MOOC providers are Coursera (76 million), edX (35 million), India-based Swayan (16 million) and FutureLearn (14 million).

Toward the end of 2014, MOOC showed rapid expansion in the market including more than 400 universities offering more than 2200 courses to approximately eight million students worldwide (Shah, 2014 cited in Anders, 2015); this was despite the anti-MOOC movement. Despite being initially described as a disruptive technology, MOOCs have been one of the most discussed innovations in the field of distance education. In only a few years, MOOCs have received tremendous coverage in mainstream media, traditional academic conferences and journals, and blogs and social media (Siemens, 2015). The rise of massive open online courses (MOOCs) has undoubtedly raised the profile and public interest in open and online learning (Gasevic, Kovanovic, Joksimovic, & Siemens, 2014; Veletsianos, Collier, & Schneider, 2015). MOOCs caught a lot attention and were researched in open and distance education (de Waard et al., 2011, Bozkurt et al., 2015a) and "…have received tremendous coverage in mainstream media, traditional academic conferences and journals, and blogs and social media" (Siemens, 2015).

The hype on MOOCs, especially in its early years, has made it quite popular to researchers. In the beginning, though, most of the studies have revolved around its enrollment and dropout rates; many also explored its effectiveness. The rise of MOOCs

has endangered or deepened questions about measuring academic competency, scholarship and authorship in networked collaborative environments, the role of faculty and students, and the business of higher education (Nanfito, 2013). Since the introduction of MOOCs in the educational landscape, many studies have explored the various aspects of MOOCs, its impact to. Initial studies on MOOCs focused on learners' perspectives, behaviors, and participation patterns (Liyanagunawardena, Adams, & Williams, 2013 cited by Anders, 2015). This later expanded to better understanding and appreciation of application of MOOCs in a digital learning environment based on existing and emerging theories of learning and technology. MOOCs' designs are anchored on the effective use of existing technology, which is ever changing, guided by different theories of learning, to create effective learning environment. Much of what has happened or is happening in MOOCs reflects the emergence of learning theories defining what this digital learning environment should be and how technology is utilized to support the learning environment.

Recent studies on MOOCs have shown MOOCs have been growing in popularity with educational researchers, instructors, and learners in online environments (Koutropoulos, Gallagher, Abajian, deWaard, Hogue, Keskin, and Rodriguez, 2012). Criticisms of MOOC included the low completion rate, expensive cost of development and majority of the completers were well educated professionals (Anders, 2015). Following the success of Coursera and Udacity, many MOOC providers were developed outside the USA.

Among which are MiridiaX, providing services to 20 universities mainly from Spain: the UK's Futurelearn, and Australia's Open2Study (Mora, 2014).

Types of MOOCs

Since the birth of the acknowledged first MOOC, several variations of MOOCs appeared but most literature recognizes two major forms of MOOCs, the cMOOC (connectivist MOOCs) and the xMOOCS (extension MOOCSs). This category is based on the learning theories on which they are founded. Anderson and Dron (2011) presented three generations of distance education according to the prevailing pedagogies and learning theories, namely, cognitivist-behaviorist (CB), social constructivist and the connectives pedagogy. MOOCs as DE can be categorized according to pedagogies. Using the two main categories of MOOCs, xMOOCs follow the cognitivist-behaviorist approach and cMOOCs are based on the connectivist approach. In between xMOOCs and cMOOCs are the hybrids that follow the social constructivist approach (Anders, 2015) referred to as Hybrids, Table 2.1 shows the hybrid MOOC design of Anders (2015).

Table 2.1.

Taxonomy of Hybrid MOOC Design

Hybrid MOOC Design			
	xMOOCs	Hybrids	cMOOCs
Primary Types	Content-based	Community and Task-based	Network-based

	One-to-many model; expert-driven learning at scale	Community; guided, social learning activities	Peer-2-peer; self-organized; networked learning
Learning Theories and Approach	Prescriptive	Prescriptive / Emergent	Emergent
	Cognitive-behaviorist Pedagogy	Social constructivist Andragogy	Connectivist Heutagogy
MOOC Applications	Blended and wrapped xMOOCs	DS106, DOCC13, FSLT12, OTL.12	ETMOOC 13, OCTEL 13

In his model, Anders would like to emphasize the essential qualities and strategies of a continuum of MOOC learning, from xMOOCs to cMOOCS; from cognitivist-behaviorist to social constructivist to connectivist or emergent learning. To him, all MOOCs can be considered hybrids as they are composed of different pedagogical practices (Roberts, Waite, Lovegrove, & Mackness, 2013, p. 2). Even if MOOCs may integrate multiple approaches, each will reflect a primary or dominant approach. Aside from the learning theories, the MOOCs are described and categorized according to the approach and learners in reference to the maturity, nature of the learners as to level of autonomy. Pedagogy is a learning approach that is teacher-centric and offers less learner's autonomy over the learning process and content. xMOOCs ascribe to pedagogical approach. Andragogy is a learning approach for adult learners and self-directed learning, allowing a

certain level of learner's autonomy but under teachers' supervision and support. This is found in the hybrid MOOCs. Heutagogy is theory on self-determined learners and recognized as the learning theory for the digital age. This provides complete autonomy to learners. cMOOCs is associated with heutagogy, which recognizes shares importance of social learning and value of connection in the learning process. In addition, Anders incorporated into his categorization Lane's classification of MOOCs into content-based, task-based, and network-based (Lane 2012). Lane described these are follows:

- Content-based MOOCs highlights the transmission of content by teachers or facilitator and acquisition of content by learners. Little importance is given to interaction among learners. It is not unusual that learners finish the course without interacting with other learners. Evaluation is done using the traditional measurement methods like written test and peer-to-peer reviews
- Task-based MOOCs emphasize the development of certain skills, by performing activities. Unlike content-based MOOCs, this type of MOOC gives due importance to a limited extent to the formation of a community of learners where exchange of knowledge and mutual help among learners happen.
- Network-based MOOCs are the first that existed. They focus on development of relationship among learners and participants consequently

lead to learning. Content delivery and acquisition of skills are not the primary concern. Learners determine the direction of their learning through building relationships, which makes pre-determined assessment impossible.

The descriptions of Lane's classification of MOOCs show strong connection and parallelism with Ander's hybrid categories. As seen in table 2.1, xMOOCs are content-based; cMOOCs are network-based and the middle category (hybrids) are community and task-based. This was modified by Anders to "better align with the theories of online learning and account for a wider range of MOOC applications. The idea of a MOOC continuum is reflected in the taxonomy of Anders. Another continuum of pedagogy, andragogy and heutagogy (PAH) of the MOOC has been put forth by Cochrane. This will be added in the taxonomy.

The discussion in the succeeding sections focused on the taxonomy of hybrid MOOC model of Anders, particularly on the design of the MOOCs, learning theories behind the design. The discourse is based on the underlying assumption that the design of the learning environment and approach features of the MOOCS are founded on the learning theories. Further discussion on the associated learners support system for each learning theory (for each MOOC taxon) is made.

xMOOCs

Despite cMOOCs being established earlier, in recent years the term MOOC has referred mostly to xMOOCs. xMOOCs are basically systems in which the instructor provides video presentations to teach the course while each student follows their coursework at their own learning speed (Mangelsdorf, 2012). Courses from a variety of fields from social sciences to computer sciences, medical training to educational sciences are offered on these sites. As previously mentioned, its popularity began with the offering of the AI MOOC in 2011. Downes coined the acronym xMOOCs to designate this type of MOOC, which includes courses offered through the learning management platforms. In addition to traditional LMS (learning management system) functions for massive users, these platforms offer enhanced options for creating and delivering multimedia instructional content (Anders, 2015). The most well-known xMOOCs are offered by MOOC provider sites like Coursera, edX, Udacity, Udemy, and Khan Academy. The courses sections of these sites allow participants to take any course they wish, conduct their assignments and quizzes, and complete the course program in each number of weeks merely by signing up as a member.

These sites generally do not provide any formal degree or diploma (Hamilton, 2012). Thus, the main purpose of participation in MOOCs is learning the subject rather than attaining credits or proficiency (Masters, 2011). The instructor prepares the course through a video or presentation while the learner passively receives the course. Bates

(2012) states that Coursera type xMOOCs are designed in which information is directly transmitted than through environments in which critical, creative, and unique thinking skills are developed (Rodriguez, 2012). It is content-based training delivered at scale through a one-to-many distribution model. Most xMOOC courses are delivered as a professionally produced video lecture series, typically delivered by a single professor. Videos are designed to be short, 4-5 minutes, and feature integrated quizzes to help students maintain focus and retain the material. The learning process may also be supported by short readings, practice problems and cases, and summative testing. xMOOCs as offered by different service providers may have certain unique features depending on the institutions offering it. However, the basic features that define the xMOOCs can be summarized as teacher-centered, content-based, centralized, system-controlled assessment, and has means for content transmission.

Some xMOOC developers and facilitators have tried incorporating varying nature of social and collaborative activities but posed problems in organizing the large number of learners. xMOOCs aim to provide essential competence for learners to engage in employment. Being competent entails comprehending the knowledge and being able to apply them in the workplace. Critiques argue that this purpose fall short of developing learners who are problem solvers and innovative.

xMOOCs' design features can be traced to two generations of learning theories, the cognitivist-behaviorist, and the social constructivist (Anders, 2015). Cognitivist-

behaviorist theory is the combination of behaviorism and cognitivism. Behaviorism defines learning as a change in behavior in the learners and can be achieved through stimulus-response and conditioning. Inputs from the environment can elicit positive change in behavior. This focuses on the transmission of knowledge giving great importance on the source of content and quality of materials to be used. Furthermore, how to learn is essential as this determines the achievement of the centralized set learning goals. Learners play a passive role in what and how of the learning process.

On the other hand, cognitivist theory of learning stresses that learning takes place when the knowledge is assimilated in the long-term memory Learners organize knowledge in a schema where new learning is integrated. There is a constant reorganization of knowledge in the long-term memory as learners learn new knowledge. This theory underscores the role of prior knowledge to which new information will be hooked to. Learning is faster when there is an attempt to relate new information past learnings. Together, cognitivist-behaviorist theory of learner underscores the importance of stimuli (information) and contextualization of the information to be given. Learning occurs when there is change in behavior (the learner can perform) and this is connected to the prior knowledge of the learners. The learner assumes passive participation in the process and acts as recipient of the knowledge. This explains why the xMOOCs are content-based and teacher-centered. The teachers have complete control on what is learned and how to learn.

Hybrid MOOCs

The middle type in the taxonomy is the hybrid MOOCs, which possess features between xMOOCs and cMOOCs. They are community and task based, guided and have social activities. Focus is on the development of skills to enable learners to perform certain tasks. The process of learning is guided by the teacher and certain level of autonomy is given to the learners, who are self-directed. As such these MOOCs are also known to follow the andragogical approach to teaching. The principal features of the hybrid MOOCs are community-based, teacher guided, task-based, and has social communication. Hybrid MOOCs differ from xMOOCs in that the teacher's role shifted to less control over the learning process. Learners are given a chance to decide on what to learn and how to learn but still within the predetermined scope. These MOOCs are founded on the social-constructivist theory and the theory on adult learners (or andragogy). The social constructivist theory proposes that learners construct their own meaning of concepts from what they experience and integrate with existing knowledge (Anderson & Dron, 2011, p. 85) Social context and interaction with other individuals are crucial in constructing meaning and acquiring new skills (Anders, 2015). In a social-constructivist system the control shifts somewhat away from the teacher, who serves more of a guide than an instructor. The shift does not mean the teachers are playing a less important role; on the contrary, the shift underscores the critical role of teachers to shaping the learning activities and designing the structure in which the desired learning

process occurs. Andragogy is another theory behind the hybrid MOOCs. Andragogy is organized instruction for adult learners. Malcolm Knowles (Kersele, 2010) presented the five basic assumptions of adult learners: self-concept, past learning experience, readiness to learn, practical reasons to learn, and driven by internal motivation. Based on these assumptions about adult learners, Knowles discussed four principles that educators should consider when teaching adults.

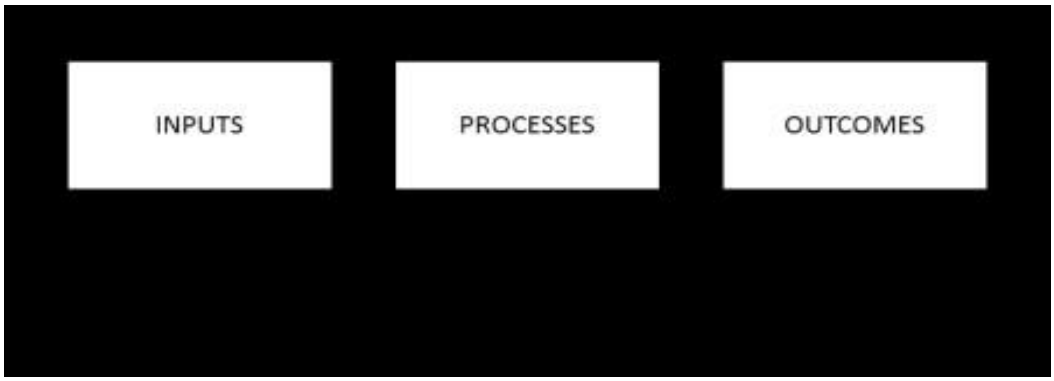
- Since adults are self-directed, they should have a say in the content and process of their learning.
- Because adults have so much experience to draw from, their learning should focus on adding to what they have already learned in the past.
- Since adults are looking for practical learning, content should focus on issues related to their work or personal life.
- Additionally, learning should be centered on solving problems instead of memorizing content.

The principles of social constructivist and andragogy rationalize the principal features of the hybrid MOOCs, particularly community and tasked-based and social network. MOOCs under this category have elements (activities and opportunities) that consider the importance of learning within a community and shared experiences through several communication platforms. In this category, learners are presented with

freedom to draw and plan for their respective direction to learning. This is consistent with the assumption of andragogy that adult learners take responsibility for their learning.

Figure 2.1.

Infographics of Knowles' Assumptions on the Characteristics of Adult Learning



Note: Adapted from "The Adult Learning Theory-Andragogy-of Knowles," by A Pappas, 2013, https://elearningindustry.com/the-adult-learning-theory-andragogy-of-malcolm-knowles June 30, 2020.

cMOOCs

cMOOCs being based on the theory of connectivism and network learning encourages the creation of knowledge more than duplication knowledge through collaboration with other learners building networks. Learning takes place because of sharing of knowledge among learners (Siemens, 2019). The assumption then is that with collaboration the greatest benefit occurs when more people put in more effort and thus work more intelligently (Shoenack, 2013). cMOOCs do not use standard technology

platform. Consistent with the theory of connectivism, cMOOCs utilize webcasts, participant blogs, tweets, software that connects blogs and tweets on the same topic via hashtags, and online discussion forums (Bates, 2019). The four key design principles for cMOOCs according to Downes (2014) as presented by Bates (2019) (Milligan, Littlejohn, & Margaryan, 2013, p. 150) are self-autonomy, diversity, interactivity, and openness. Based on these four design principles, Bates (2019) continued discussing how these design features are translated into the actual cMOOCs practice. However, he disclaimed that cMOOCs are fast evolving and new translations could appear in some versions of cMOOCs. Nonetheless, one could find these elements as integral parts of cMOOCs: connectivity through social media and collaboration through learning management systems (LMS), learners' determined content, distribution of communication, and feedback/assessment. Therefore, cMOOCs primarily use a networked approach to learning based on autonomous learners connecting with each other across open and connected social media and sharing knowledge through their own personal contributions. There is no pre-set curriculum and no formal teacher-student relationship, either for delivery of content or for learner support. Learners learn from the contributions of others, from the meta-level knowledge generated through the community, and from self-reflection on their own contributions, thus reflecting many of the features of communities of interest or practice.

cMOOCs employ a system in which rather than being limited, the learner is free throughout the learning process, allowing them to determine their own learning goals. Just as this situation has its advantages, it may be stated that this situation makes the assessment and evaluation along with the certification processes quite difficult (Lugton, 2012). The openness of cMOOCs and the relative autonomy of learners allow these connections to be formed without central platform. The goal of cMOOCs is to facilitate emergent, self-organized patterns of collaborative learning. cMOOCs are designed to be readily accessible allowing learners to engage using their own blog sites and social media accounts. The course website contains minimal items like a set of freely available readings, schedule of weekly webinars by guest lecturers. The real activity of cMOOCs takes place in postings and commentary on participant blogs, social media discussions, video-chats, and other online events. Shared hashtag that puts these activities into a shared stream is one of the major features of cMOOCs. The shared stream has taken the form of a daily email with links to participant blog and social media posts, and upcoming virtual events.

While most cMOOCs hold seminars as venues for discussion on a set of weekly readings and webinars, some have structured activities that facilitate the development of specific skill or competencies. It is important to note that cMOOC learning experiences are networked, open, and decentralized. A single individual may be involved in multiple courses and in multiple sets of overlapping connections. What is interesting is that learners can see the history and outputs of these learning experiences since these are available on

the learner's blog and social media accounts. Connectivist learners do their individual learning while also contributing to the growth of networks of connected and connective knowledge over time (Downes, 2012).

These are the descriptions of Siemens (2017) of connectivism as a theory of learning for the digital learners. "Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements—not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing. Furthermore, he identified the following principles of connectivism.

- Learning and knowledge rests in a diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections are needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.

- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

Siemens (2004) states that behaviorism, cognitivism, and constructivism are insufficient in that they were developed in an era in which technology was not as developed and influential on education. The learning process in connectivism takes place as the learner feeds their knowledge through making connections with the collective knowledge of the community (Anderson & Dron, 2011). These connections are established in a biological/neural, conceptual, and social/external context (Siemens, 2008). Connectivists state that learning is not merely the transfer of knowledge from the teacher to the learner and does not take place in a single environment, instead they state that knowledge is transformed and transferred through the interactions of people, especially in a web environment (Kop, 2011). The theory of connectivism indicates that everyone is responsible for their own learning. In cMOOCs, each learner structures and manages their own learning. They establish their personal learning network through nodes and connections (Levy & Schrire, 2011). cMOOCs may be considered extensions of personal

learning environments (PLE) and personal learning networks (PLN). Kop (2011) indicates that the first cMOOCs were like the environments denoted as personal learning networks.

MOOC Learning Environment

Learning environment refers to the diverse physical locations, contexts, and cultures in which students learn. As learning can take place anywhere, the learning environment does not only pertain to the conventional classroom (with four walls, blackboards, desks and teacher's table, shelves, and books); it encompasses any setting including the cyberspace where digital learning can occur (Ed Glossary, 2021). Whether learning is formal or informal, there are essential elements that are present, but these are organized differently depending on the learning theories on which they are based. The learning theories provide direction to the course developers and educators on how the learning should proceed; what resources are needed; how to assess learning and what content to include most importantly, how to organize all these elements to have a positive learning environment.

The typical elements of a learning environment are the learners, teachers, content, assessment, skills, resources, and learner support. Of these elements, the teachers are a strategic element as they are responsible for designing the learning environment. Conscientious teachers usually consider the learners (nature, prior knowledge, status, needs and goals) and learning theories when deciding on the content, skills, assessment, resources, and learner support. Regardless of the modality of the delivery of education,

these elements are present, but the quality of resources and assessments will vary. For example, the type of resources for online learning will be more on digital forms because of the physical separation or distance between the teachers and the learners. Similarly, the extent of the learner support system will be defined by the other elements, especially the needs of the learners that may be related to issues in technology.

In ODL and MOOCs, the learning environment is digital where the space and context are outside the physical classroom. The learning environment that is created by the developers tells a lot of the learning theories that are used as a basis (Anderson, 2012; Bates, 2015). The learning theories direct the approach that differentiates MOOCs. To create this learning environment, learner support systems are very important in bridging the gap caused by the absence of physical interaction. Through these learner support systems, content is disseminated, interactions among students and between students and teachers are made possible. Developers try to make use of these learner support systems to compensate for the lack of physical interaction.

Learner Support Systems

The concept of learner support has always been considered an important aspect of traditional education. In the context of online learning, however, it was given more emphasis due to the physical absence of the teacher/instructor. The concept of learner support is not new as well however in the context of open and distance learning it was pointed out by Robinson (1995) the lack of empirical research on learner support, as what

was mostly written were mostly descriptive and prescriptive. Recommendations to have more pure research to provide more theoretical approaches and frameworks were proposed. Since then, a significant number of research studies have been done about learner support.

Definition of Learner Support

In the beginning, learner support was initially divided into two forms as described by Melton (2002). These two are a) materials provided by the institution and b) support systems that students needed to help them overcome problems that they encounter during their studies. These forms of support may vary regarding who provides the support and the ‘time' the support is being given. Sewart (1993) saw student support as the interface between the institution and its students. He expounded that it may or may not embrace the following: class teaching at study centers; individual tutorials at study centers or other locations; annual residential schools (compulsory or optional); study or self-help groups; social events; counseling sessions at study centers; correspondence with tutor and counselor; telephone contact with tutor and counselor; group telephone tutorials; radio tutorials; audio cassette 'correspondence'; computer-mediated communication; and student newspapers. Moreover, there were several meanings given for learner support. One of the pioneers in student support conceptualization, Tait, (1995) defined learner support as an emphasized uniform course material intertwined with the interests of diverse groups of students, as individuals and learning groups. Keegan (1996), quoted by Thorpe, identified student or learner support services as one of two distinct subsystems within distance

education (along with course development). Thorpe (2002) categorized learner support into three ‘themes’ the meanings of learner support. These themes are ODL Sub-systems with distinctive roles - learner support individualizing, humanizing; institutional intermediaries; and interpersonal response. According to Thorpe, learner support is to identify a distinctive and important set of practices carried out at a different time and often (though not necessarily) by a different group of people from those producing the course materials — up until, that is, the use of online and collaborative learning. Her three themes encompass and recognize overlapping learner support definitions provided by authors like Tait and Keegan for the first theme. Thorpe likewise mentioned and expounded on three essential and interrelated elements of learner support: identity, interaction, and time/duration. Sewart, Brindley, Waiti, & Zawacki-Richter (2004) defined learner support as all those activities and services in education that have been developed to help learners meet their learning objectives and gain the knowledge and skills that they need to be successful in their courses. It includes activities like tutoring and teaching, counseling, and advising as well as services like learning and study skills assistance and academic advising. Also, it also assists in administrative activities such as admission and registration, library and information systems, and infrastructure support for activities such as peer tutoring (Brindley, Waiti, & Zawacki Richter, 2004). Simpson (2002) also looked at learner support as all activities extending beyond the production and delivery of course materials that assist students in their studies. Similarly, Mills, as quoted by Ozoglu (2009) defined

learner support as the totality of the provision by an institution to support the learner, other than generic teaching materials produced by instructional designers/course producers". Furthermore, Mills pointed out the distinction of generic learner support against individualized learner support. The concept of effective learner support was to produce and use a perfect package of instructional materials (course units, set books, radio and television programs, etc.). The idea was for it to be good so much so that Sewart (1993) emphasized, "possibilities for instruction to the point of, indoctrination rather than education is so much better." Also, Rumble (2000) pointed out that the scope of student support (that is, the package of benefits that it will offer its students) will be different. Hence, it is very much likely that various ODL institutions will adhere and follow various learner support models to meet their goals. Bates (2012) defines learner support as the interactive and pedagogical conditions in a course that aim to support the learner's ability to understand and learn the course content. Learner support includes all activities and services in education that have been developed to help learners meet their learning objectives and gain the knowledge and skills that they need to be successful in their courses. (Brindlye, et al, 2006). These are provided by the instructors or other learners or the content and other information and communication technology (ICT) (Laurilland, 2-16 as cited Gregori et al, 2018).

Some of the most important challenges for ODL and MOOCs include learning quality and learner retention (Brown, Costello, Donlon, & Giolla-mhichil, 2015; de Freitas,

Morgan & Gibson, 2015). The distance between teachers and learners is one challenge that is why MOOCs are largely designed for autonomous learning. It is argued that learner support that is purposefully integrated into the instructional design and pedagogy of the content results in better learning outcomes and retention than the use of the supplementary learning tools available within the MOOC experience (Gregori et al., 2018). Effective learner support system has been correlated with successful completion of online courses especially of MOOCs (Brindley, 2014; Gillani & Eynon, 2014, Laurilland, 2016). Integrated learner support is important to facilitating an enriching and quality learning experience that will ultimately lead to better learning outcomes and greater retention (Hardman & Dunlap, 2003; Tresman, 2002; Van Rosmelan et al., 2008). In their study, Brindley et al (2018) argued that learner support that is purposefully integrated into the instructional design and pedagogy of the content yields better learning outcomes and retention than the use of the supplementary learning tools available within the MOOC experience. (de Frietas et al., 2015). Despite this, most MOOCs developers focused on the content transmission and made learner support as supplementary than integral part of the MOOCs.

Learner Support Models

Several models were developed to describe and present learner support in the context of various modes of ODL. As early as the beginning of online learning, learner support has already been recognized to play a vital role in providing needed support for the

learner. To do this, Tait (1995) emphasized knowing and understanding the user and his or her background. Simpson (2015) focused on identifying qualities and skills students need to succeed in a distance learning environment. Based on the responses in his study, he came up with three categories from the responses: (1) Cognitive (or academic) skills is developing a student's learning and cognitive skills; it involves not just teaching but also the development of other learning skills as well as assessment and feedback; (2) Organizational support is about helping the students with the management of their studies along with their work and/or family; (3) Emotional support is involved in helping students deal with the emotional side of their learning --- includes motivation, dealing with stress, building self-confidence, to name a few. Simpson also extensively described various ways by which non-academic support can be categorized. Some of these ways are direct versus indirect support for the student, reactive versus proactive support, sources of support, the timing of support, media support, and cost and benefits of support.

Tait and Simpson described the development of learner support in Open University UK. Tait (2003) drew on the rationale of student support containing the following: Cognitive (supporting and developing learning), Affective (that is related to the emotions that support learning and success), and Systemic (helping students to manage the rules and systems of the institution in ways that support persistence. Tait (2003) placed great emphasis on two things that contribute to a successful student support system: feedback and access. In the Open University UK context, feedback was demonstrated by responding

in a timely way and ably helped by technology. His classic example was OU UK's Isaac Pitman, who in 1844 offered to teach shorthand via postal services, with the commitment of providing feedback by sending the materials back to the students. The "integration of support and assessment," the importance of timeliness when teaching and learning are separated by time, and centrality of direct personal feedback, were all very useful in student support (Tait, 2003). Access, on the other hand, is the concept of allowing social mobility and gender to be non-issues in the context of student support. OU UK in the first part had regional centers catering to the needs and queries of the students. It was later replaced by a call center making feedback more immediate and accessible. Now, they were more focused on student support as an integrated activity, (Tait, 2004) as well as learning in a social and local context, and continuity.

The ARCS (affective, reflective, cognitive, and systemic) model of Atkins (2008) also believed in the three main aspects of student support that Tait mentioned, i.e., cognitive, affective, and systemic. Atkins' ARCS model includes both academic and non-academic aspects of the support, looking closely at the DE students' perspectives. The unique domain in ARCS model as compared with Tait's is the reflective domain. In this domain, motivations/interests and reasons for studying were also being sought. Similarly, Jung and Hong (2014) recognized these four learner support systems presented by Atkins. However, in their study of distance learners from several Asian countries like Japan, Korea, Malaysia, India, Philippines, and Thailand, they were able to identify gender as a vital

support system for Asian distance learners, which eventually they developed into an elaborated model later based on Atkins' model. Affective support is the means to sustain motivation and connection. Under this support are social support, practical support, and emotional support. Reflective support emphasizes assistive and developmental guidance in this support for distance learning. Cognitive support highlights the promotion of effective and efficient learning through tutorial and assessment, content support, and strategic learning. Systemic support pertains to establishing an integrated and customized system for the learners to access.

Gunawardena cited Dillon and Blanchard's learner support system for distance learners. The framework highlighted recognition of these four types of support in consideration of designing for diverse learners. It identified the four supports as one that: addresses learner's needs and needs of the content, relates to the institutional support and technology and communication. Apart from these models which highlighted the types of support for the learner, there is another classification presented by Bates (2015), which focused more on activities in the four categories he has presented.

Each category highlights various activities as examples of learner support. These are presented in the scaffolding, feedback, counselling, and other learners. Scaffolding involves activities that intent to help learners as they struggle with new concepts or ideas; gain deep understanding of a topic or subject; evaluate a range of different ideas or practices; understand the limits of knowledge; and go beyond their current level of thinking

or practice to acquire deeper understanding or a higher level of competency. In feedback, various ways of providing feedback on learner's performance of activities such as writing assignments, project work, creative activities, and other activities within and outside the scope of automated mechanism, were given as examples. For MOOCs, this is a big challenge, the magnitude of which depends on the type and design of the MOOCs. The third category, counselling, refers to help and guidance on administrative or personal issues, such as whether to repeat a course, delay an assignment because of sickness in the family, or cancel enrollment in a course and postpone it to another date. This is easily included in the design of an effective learning environment. Logistical and administrative concerns of the learners can be immediately addressed and allow learners to focus on the academic aspects of the course. The last category is other learners. Bates stressed that learners can be a great support for one another. While this normally happens in face-to-face setting, this is a challenge in online distance learning environments especially with MOOCs with massive enrolment. However, teachers can make this possible by designing collaborative learning activities, group work, and designing online discussions so that learners can learn together rather than individually.

Apart from Bates, Gregori, et al., (2015) also examined learner support in a different way and presented three categories of support: peer, content, and instructor. Peer support is like the activities with other learners cited by Bates. This is consistent with the social network approach to understanding peer-support learning, in that learners learn

better in a community. Consequently, various forms of technology have also been developed to assist this collaborative approach based on social networks. The massive number of MOOC learners pose a problem with the initiation and management of peer-to-peer interaction (Chen, 2014). Peer interactions have been found to have a significant influence on student success. This powerful interaction is associated with an improvement in learner motivation and engagement (Yang et al., 2013) because of the social factors. The interactions identified in MOOC forums have also been correlated with better grades and higher retention rates (Coetzee, Fox, Hearst, & Hartmann, 2014). Content support is the oldest form of learner support and is organized around formative assessment, modules, and didactic conversation (Holmberg, 2005). These forms of learner support are commonly referred to as dashboards, e-portfolios, and badges, and as forms of learner support, and serve to deepen engagement with content by providing a synopsis or archive of learning activity. The teachers, traditionally, are responsible in providing this support, which are associated with learners' use of tools (taking tests, watching videos, reading lectures); satisfaction with the tools; concerns about accessing tools or content; and suggestions regarding other resources (e.g., links, books, groups, social networks). It has been reported that the effective use of multimedia (video lectures, audio files and infographics) can stimulate student interest and facilitate course retention and learning (Conole, 2013). Video watching is the most valuable and useful resource for MOOC learners, with the optimal length of a video being under six minutes. Finally, instructor support refers to the activities

and resources that instructors provide to the learning environment to help the learners. Activities are parallel with scaffolding, feedback and counselling as mentioned by Bates. Instructors may play the role of packaging content materials and activities for effective content acquisition or skills development; or shift to a more challenging role of guiding learners to design their learning journey. In the latter role, teachers are co-learners while enabling and encouraging his or her students to assume a teacher's role in the open learning process.

Considering the conditions for learning warranted by the theory on self-determined learning and heutagogy, the learner support's role focuses on providing avenues for the learners to do their independent learning processes. Apart from content dissemination, learners are encouraged to explore and pursue their interests and even work outside the topics. As such, the learning environment should provide support for the learners for these learning processes.

Heutagogy and PAH Continuum

The concept of heutagogy or self-determined learning is not a new concept despite the relatively few articles written about it. Heutagogy is usually used synonymously with self-directed, autonomous, and independent learning. It was first defined by Stewart Hase and Chris Kenyon (2000) "as the study of self-determined learning and applies a holistic approach to developing learner capabilities with the learner serving as "the major agent in their learning, which occurs, because of personal experience." The term was derived by

Kenyon as a play of words on the Greek word, navtoc, meaning self. Its roots can be traced to various learning theories such as humanism, constructivism, double-loop learning, and andragogy (Blaschke, 2017). Various authors have described this as emerging or relatively new while some say otherwise.

Hase and Kenyon (2013) argued the need for this 'new approach' in this rapidly changing society and information explosion, they asserted that we should be looking at an approach that not only shifts away from a traditional pedagogical approach to andragogy, where adult learners negotiate level of autonomy and control with the teacher, but also to an educational approach where the learner determines what and how learning should take place (Gazi, 2014). In this approach, learners are expected to be highly autonomous but still meeting the competencies and producing the skills expected. Moreover, the goal of heutagogy is to create responsible, self-capable, proactive, competent learners, who are ready to face the challenges of the increasingly connected world.

cMOOCs was initially based only on connectivism however heutagogy is highly correlated with connectivism and cMOOCs, especially with an emphasis on leveraging network connections to solve problems and to grow capacities for self-directed learning. (Anders, 2015). Blaschke (2012) developed it as an extension of andragogy. In heutagogy, the teacher yields the control of the learning process to the learners, who become the major agents in their learning. The center of the learning process is the learner and not the curriculum. Unlike andragogy, the emphasis changed from acquisition of specific skills

and competencies to the development of capabilities or capacities. Moreover, there is an emphasis on self-efficacy and broader applications of learning in collaborative and problem-solving contexts. Several authors have examined how heutagogy has impacted online learning and distance education. Halupa (2017) expounded how critical thinking, volition, and creative problem solving. In Halupa's study, she explored the key concepts of critical thinking, volition, and creativity vis-à-vis heutagogy.

Hase and Kenyon (2013) presented seven elements if the heutagogical approach is adapted to learning. In the context of non-formal education, some of these may no longer be needed. These are approval, facilitators, agreement, review, assessment, and feedback. Before executing and implementing heutagogical approaches, it is imperative that approval from a governing body must be secured. The existence of facilitators, who will provide guidance and resources will be highly beneficial. An analogy of this is a learner developing his 'learning map' while the instructor serves as the guide. With that, choice will also be dependent on the learner. However, facilitators must consider three things as they provide guidance: relevance, achievability, and level. Upon choosing, the facilitator and learner must agree on several things: time frame for the learning, the methodologies to be used, the frequency of reviews and progress, and the form of a final assessment if it may be required. In the review element, it is imperative for facilitators also to have a check on new knowledge and insights acquired by the learner. These may be done (and agreed upon) by the facilitator and the learner. Assessments should be consistent and met. Lastly, feedback,

although not required, is highly encouraged so that facilitator and learner can exchange ideas and experience.

Principles of Heutagogy

The design is informed by the following five principles of heutagogy:

- Learner-centered and learner-determined. The role of human agency in learning is a fundamental principle. The learner is at the center of all heutagogic practice. The learner is self-motivated and autonomous and is primarily responsible for deciding what will be learned and how it will be learned and assessed.

- Capability. Capability is characterized by the following: being able to use one's competencies unfamiliar as well as familiar circumstances, learner self-efficacy, communication, creativity, collaboration (teamwork), and positive values.

- Self-reflection and metacognition. Within heutagogy, it is essential that reflection occurs in a holistic way. This translates to the learner reflecting not only what she or he has learned, but also the way in which it has been learned — and understanding how it is learned

- Double-loop learning requires that learners are both psychologically and behaviorally engaged. They reflect on not only what they have learned, but also the way in which this new knowledge and the path to learning have influenced their values and belief system.

- Nonlinear learning and teaching. As learning is self-determined, the path to learning is defined by the learner and is not established by the teacher. As a result of learners choosing their own path, learning happens in a nonlinear format (metacognition).

Heutagogy and Web 2.0 Affordances

The increasing interest in heutagogy is also a result of the technological advances and advent of online learning environments, where the learners have access to a plethora of resources and are expected to take charge of their learning (Gazi, 2014). In 2013, Hase and Kenyon were able to provide a framework for considering these systems in a holistic way, and the latest technologies serve as the agents for extending and supporting the framework. Moreover, they emphasized that new technologies have features that allow learners to become more active, more self-directed, and more self-determined in their learning, as well as collaborating others in the creation of new content. Web 2.0 technologies may include blogs, wikis, social bookmarking and networking tools and other online collaboration tools. These technologies, emerging only in the last decade, have brought with them certain key features that support new forms of teaching and learning, allowing learners to become more active, more self-directed, and more self-determined in their learning, as well as collaborating with others in the creation of new content (Hase and Kenyon, 2013).

Using Lee and McLoughlin's concepts, Hase and Kenyon highlighted key features of Web 2.0 technologies that may be useful for the heutagogical approach. These features may be seen in the table below, Table 2.2.

Table 2.2.

Features of Web 2.0

Web 2.0 Feature	How it Works	Examples
Connectivity and social rapport (presence) / communication	Supports creation of people networks and enables interaction among learners and instructors	Social networking (e.g., LinkedIn, Twitter, Facebook); MOOCs
Content discovery/sharing (individually and collaboratively)	Gives learners the ability to search and discover information and share it with other learners	Social bookmarking (e.g., Del.icio.us, Diggo, StumbleUpon); social networking; Rich Site Summary (RSS) feeds; MOOCs
Content creation (individually and collaboratively)	Supports learners in actively creating new content as opposed to consuming content	Online collaboration (Google Docs); blogs; Wikis; mashups
Knowledge and information aggregation and content modification	Supports learners in collection and customization of available information for personal use	Online collaboration (Google Docs); blogs; Wikis, open educational resources (OERs), personal learning environments (PLEs)

Using this as a pattern, Blaschke (2012) presented a table that outlines these design elements and examples of technology that can be used.

Table 2.3.
Outline of Design Elements and Examples of Technology (Blaschke, 2012)

Explore	Learners must be given the freedom and opportunity to explore a variety of paths and sources of knowledge	Internet (Google and Wikipedia); digital libraries and organizational app (Flipboard)
Create	Giving the learner the freedom to create using a variety of learning approaches, e.g., writing, designing, and drawing, and mind maps	Mind maps (popplet.com); Online blogs (Wordpress, Weebly, PBWorks)
Collaborate	Provide the kind of environment where learners can learn from each other. Working together toward a common goal, learners can solve problems and reinforce their knowledge by sharing information and experiences, continuously practicing, and experimenting by trial and error.	Google Docs; Wiggio
Connect	New avenues of learning can be created. Making connections is easy with today's social media, which gives learners an opportunity to network with people across the world.	Twitter, LinkedIn, Academia, Facebook, WhatsApp, Google, Telegram, Teleconferencing (Zoom)
Share	Sharing information with other learners can lead to more	SlideShare, Research Gate, Twitter, and Facebook

	discoveries and experience, and potential opportunities for future collaboration.	
Reflect	Opportunity to ascend to higher levels of cognitive activity such as analysis and synthesis. Repetition helps information move from short- to long-term memory. This reflective activity should include reflecting on the new knowledge that the learner has gained, as well as how she or he has learned—and the effect of learning experience on the value system experience has influenced his or her value system and beliefs.	Reflective journals

The humanistic nature of cMOOCs is strongly influenced by both connectivism and heutagogy with the strong learner's autonomy on almost anything and everything about the learning process. The cMOOCs seem to be the main avenue where learners experience interacting with different resources within the platform and outside the platform as they desire andseem fit for their needs. The amount of learning that can be achieved depends so much on the learners. With the relinquishment of teacher's control over learner, there is greater demand for learners support to assist the learners in their chosen journey.

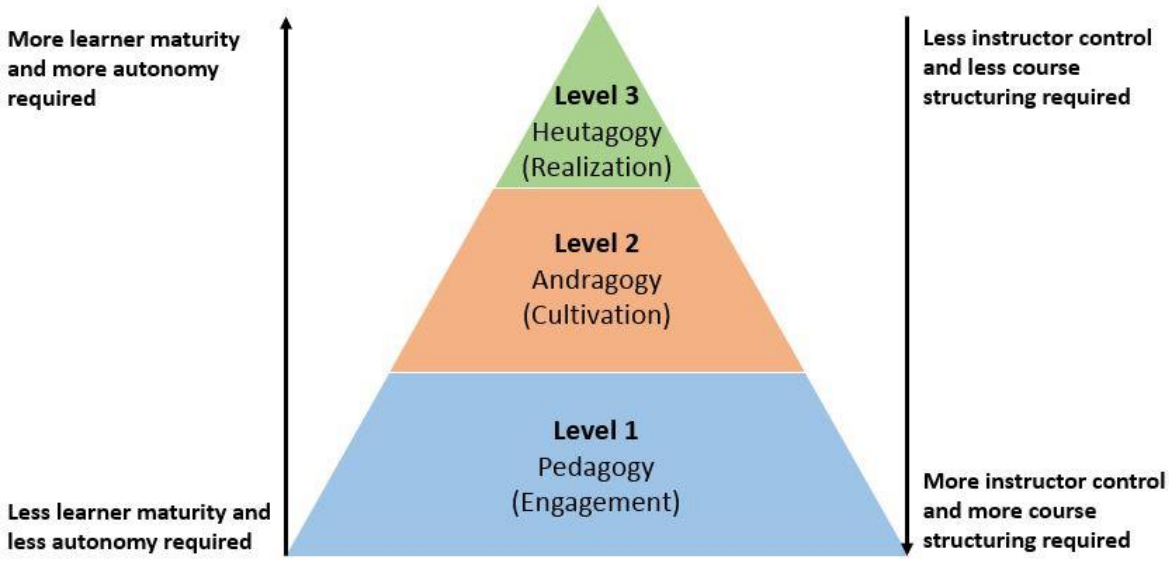
PAH Continuum

In the realm of education, the concepts of pedagogy, andragogy, and heutagogy can all be treated separately. Over the years, the differences among the three have been more

obvious/noticeable as many researchers and educators have recognized the various learning strategies that can be derived from each concept and its impact on learning. Pedagogy has been defined as the art and science of teaching or education (to some). Patel (2018) reiterated that pedagogy is the art and science of teaching or leading (from the Greek word, agogy) the child (from the Greek word, pedi). The concept of andragogy otherwise known as adult learning is widely like pedagogy however it specifically refers to the teaching methods and principles of a specific group, i.e., adults. The word comes from the Greek word, andr, which means man, and agogos, meaning leader of. It means "leader of man" whereas pedagogy meant "leader of children." Two main concepts are related to andragogy: lifelong learning and Knowles' concept of self-directed and autonomous learning. Tay (2013) presented the concept of learners' transition through the three stages of learning: pedagogy, andragogy, and heutagogy. This transition was previously presented by Tay and Hase (2004) and simply described as a three-stage learning process from pedagogy to andragogy to heutagogy through aesthetic appreciation that affords keen pleasure to the senses and charms the intellectual faculties. Tay further expounds that pedagogy is the first stage, wherein some preliminary education on the selected object or context is needed. Next, andragogy (also known as adult learning), is to construct an abstract representation of the phenomena. This stage also allows us to dig deeper into the problem situation. Tay highlighted the use of modeling in this case so that learners may articulate, structure, and critique an existing model that was developed. Lastly, heutagogy

is the last stage. During this stage, it is when new knowledge associated with deliberate open gaps will be sought.

Figure 2.2.
Progression from pedagogy to heutagogy (Canning, 2010)



Notes. Progression from pedagogy to heutagogy (Canning, 2010).

Canning (2010) also provided this progression of pedagogy to heutagogy as shown in Figure 2. The left side of the pyramid-like model looks at learner maturity and autonomy while the right side looks at instructor control and course structuring. These concepts are inversely related to this model. This diagram shows the PAH continuum with regards to the level of instructor control, maturity, and autonomy of learners. As one moves from level 1 pedagogy to level 3, the instructor's control diminishes, maturity and autonomy of learners increase.

MOOCs and PAH Continuum

In conceptualizing his taxonomy of hybrid MOOCs, Anders (2015) believes that each MOOC is really a hybrid in the sense that a MOOC may have design features attributed to other learning theories. This means that xMOOC may have features of social constructivist theory. In the same manner, cMOOCs may have also social constructivist theory. There could be a continuum from xMOOC to cMOOCx from pedagogy to andragogy to heutagogy. Luckin et al., (2010) coined the PAH Continuum to describe how learners' transition through Pedagogy to Andragogy and finally Heutagogy (Hase, 2012). The idea that the learner transitions from pedagogy to andragogy to heutagogy (PAH continuum) has become popular and has been observed in higher education (Tay & Hase, 2013), lifelong learning (Blaschke, 2012) and school education (Price & Andrews, 2014). Certainly, it appears useful in transitioning people from teacher-centric to learner-centered learning. Cochrane & Antonschak (2015) designed and developed a course based on the PAH continuum. A snippet of their framework can be seen on Table 2.4.

Table 2.4..

A snapshot of the mobile social media framework for creative pedagogies (Cochrane & Antonschak, 2015)

Topic	Triggering event	Activity design	Conceptual shift	SAMR	PAH and creativity
Week 1: Introduction to social media	International guest (UK) via Hangout "The power of social media and curation"	Students create the following mobile social media accounts: G+, Google Hangouts, Google Drive, YouTube, Vimeo, Twitter, Storify, Bambuster, Behance, and are invited to join a G+ community for the course	Teacher modeled educational use of mobile social media and G+ community participation	Redefinition of course LMS as a collection of student-owned social media --- building a learning community	Pedagogy, Reproduction
Week 2: Brand yourself	Guest speaker from Journalism Department: "The power of an online profile"	Students showcase their creativity via a six second Vine video	Teacher guided exploration of digital identity	Redefinition of social media as an educational platform	Andragogy, Incrementation

This framework charts a three-stage continuum across several key factors such as the locus of control, course time framework, knowledge production and the conception of three levels of creativity. This provides guidelines in designing activities for each level. The table before is a partial reproduction of the design of the course based on the framework. For each week, there is a triggering event which is a talk of expert/s who present information related to the topic. Activities and technologies to be used are described under activity design. In the last column, the PAH and creativity are indicated. It could be seen how activities progress from pedagogy to andragogy to heutagogy.

Table 2.5

Comparison of Pedagogy, Andragogy, and Heutagogy (Blaschke, 2016)

	Pedagogy	Andragogy	Heutagogy
Locus of Control	Teacher	Learner	Learner
Course timeframe and goal	Initial establishment of the course project and induction into the wider design community	Early to mid-course: Student appropriation of mobile social media and initial active participation	Mid to end of course; establishment of major projects where students actively participate within an authentic community of practice
Cognition Level (Danvers, 2003)	Cognitive	Meta-cognitive	Epistemic
Knowledge production context	Subject understanding: lecturers introduce and model the use of a range of mobile social	Process negotiation: students negotiate a choice of mobile social media tools	Context shaping students create project teams that investigate and critique user-

	media tools appropriate to the learning context	to establish an ePortfolio based upon user-generated content	generated content. These are then shared, curated, and peer-reviewed in an authentic COP.
SAMR (Puentedura, 2006)	Substitution & Augmentation	Modification	Redefinition
	Portfolio to ePortfolio Powerpoint on iPad	Reflections as VODCast Prezi on iPad	In site reflections Presentations as dialogue with source materials
	Focus on productivity	New forms of collaboration	Community building
	Mobile device as a personal digital assistant and consumption tool	Mobile device as a content creation and curation tool	Mobile device as a collaboration tool
Supporting mobile media affordance	Enabling induction into a supportive learning community	Enabling user-generated content and active participation within an authentic design COP	Enabling collaboration across user-generated contexts, and active participation within a global COP
Creativity (Sternber et.al., 2002)	Reproduction	Incrementation	Reinitiation
Ontological shift	Reconceptualizing mobile social media: from a social to an educational domain	Reconceptualizing the role of the teacher	Reconceptualizing the role of the learner

Research Gaps

It has been shown that studies in MOOCs are focused on their characteristics, difference and commonalities, effectiveness, and few on what the design of the learning

environment with learner support as an integral component of the MOOCs. Even if MOOCs are classified based on learning theories, as xMOOCs (pedagogical), hybrid (pedagogical-andragogical) and cMOOCs (connectivist and heutagogical), there are very few to nil studies on the design integrating learner support as major components of the MOOCs. Thus, this study intended to fill this gap by designing MOOC utilizing appropriate learner support systems aligned with the PAH approaches.

Conceptual Framework

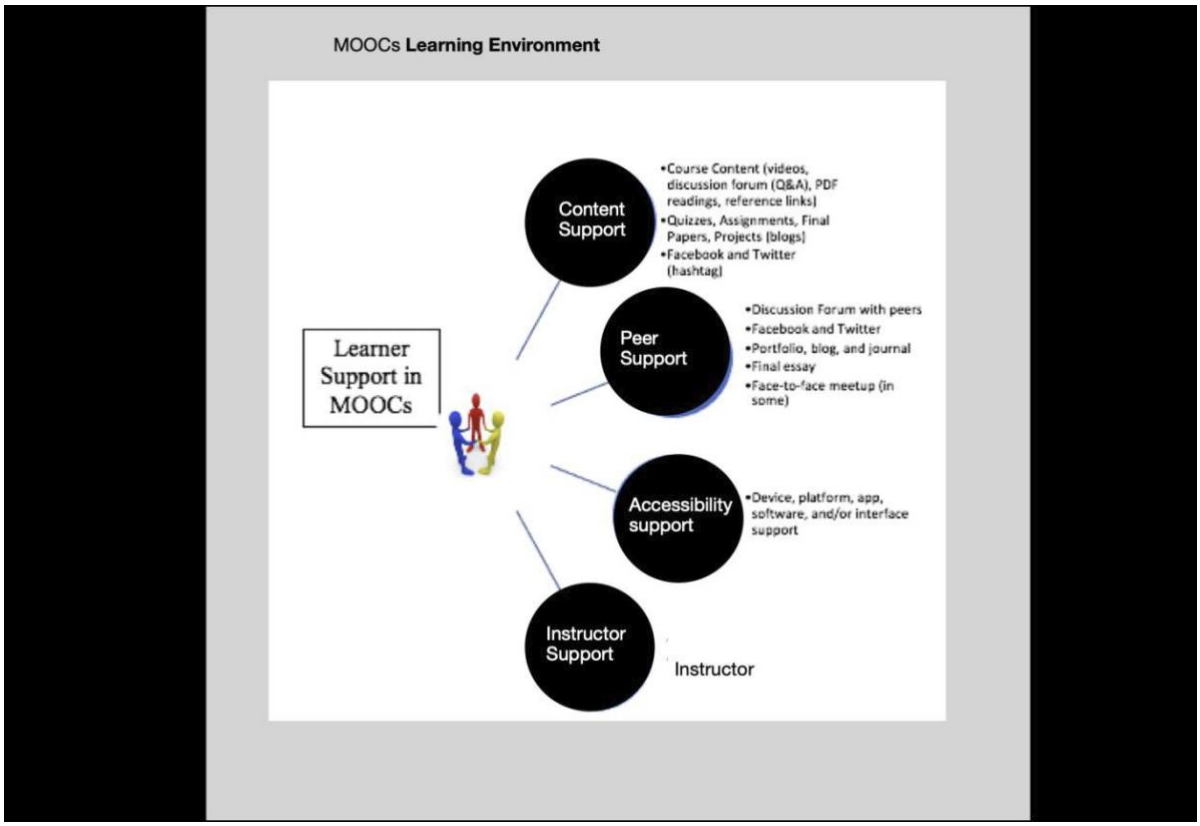
Putting all the major concepts from the reviewed related literature, the conceptual framework presents the overall context in which MOOCs are designed with integrated learner support with features that promote learning. Figure 3 presents the conceptual framework for this study.

Designing MOOCs, like face-to -face classroom teaching, involves the creation of the learning environment (Bates, 2019), in which learner support should be an integral part. Just like face-to-face learning environments, theories of learning remain the main considerations in determining how the learning environment should be. Each theory of learning proposes a particular approach that defines the learning environment and consequently affects the role of teachers; the kind, features and role of the learner support system.

The different theories that are shown in the framework are the bases for the different types of MOOCs, namely the xMOOC, Hybrid MOOCs and the cMOOCs. The learning environment for each of these types of MOOCs has been discussed in the previous sections. xMOOC follows the pedagogical approach based on the theory of behaviorism. Hybrid MOOC adheres to pedagogical-andragogical approach based on the theories of behaviorism, adult learning, and constructivism. Lastly, cMOOC is designed in accordance with connectivism and heutagogical approach based on theory of connectivism and heutagogy. Apart from the theories, the nature of learners is also a significant consideration in the design of the learning environment and the selection of the appropriate learner support.

Figure 2.3.

Conceptual Framework



In MOOCs, digital learning causes a shift of the role of teachers from full control of the learning process as in face to face, to facilitator, relying on learner support. What the teachers cannot do in digital learning like interaction and personally doing the dissemination of content is compensated by the learner support. The design of MOOCs learning environment which focused on learner support is based or defined by the theories of learning on which the MOOCs espoused. The massive and open nature of MOOCs places the control of learning at the discretion of the learner (Terras & Ramsay, 2015). In the context of MOOCs, the learner and support to the learner play a very significant role. Throughout the years, several studies have examined learners in the context of online learning and MOOCs as well as how it relates to the bigger scheme of things leading to positive outcomes in learning and teaching. These approaches are almost always based on existing learning theories that provide a guide as to how it will be executed in the classroom.

Cognizant of the peculiar designs of the different MOOCs as founded on different learning theories and the importance of learner support as an integral part of the instructional design of MOOCs, the possible learner supports are identified for each type of MOOC. An important aspect of a good learning environment of MOOC is the learner support because they provide the necessary help for learners to be successful in achieving their respective learning goals. The type of learner support depends on the design and

learning theories behind the MOOC. Below is the table of type or characteristics of learner support as determined based on the MOOC type.

Table 2.6
Possible learner support for each type of MOOCs

MOOC Type	Main Features / Focus	Learner Support Peer Support	Content Support	Instruction Support
xMOOCS Pedagogy Cognitivist-behaviorist	Content-based; content acquisition	Discussion board where anyone can post ideas, questions and comments related to the topic	Tools for uploaded content (e-copy, video, links to websites on topics); invited experts	Tools for consultation; Q&A Suggestion box
	One-to-many model Teacher-centered	Directory of learners who wants to give their information		Tools for accessing assessment and results of assessment
Hybrid MOOC Andragogy Social constructivist	System Controlled Assessment Interaction with other learners Metacognition and evaluation to develop learners' capacity to assess their own learning, multiple perspectives social discussion, validation, and	Tools for discussion with other learners; constructive discussion	Search engine Blog technology Mind mapping tools Organizational tools	Sharing technology Platform of creation and dissemination of portfolio (creative outputs) Use of hashtags

	application in real world contexts self-directed learning Learner's freedom to explore a variety of paths and sources of knowledge Giving the learner the freedom to create using a variety of learning approaches Collaboration among learners to solve problems and reinforce their knowledge by sharing information and experiences, continuously practicing, and experimenting.		Use of hashtags	
cMOOCs Connectivist Heutagogy		Internet (Wikipedia) Digital libraries Organizational app (Flipboard)	Search engines Blog technology Mind mapping tools Organizational tools Use of hashtags Digital libraries Mind maps (popplet.com) Online blogs (Wordpress, Weebly, PBWorks)	
PAH	Connect and sharing information Consolidated features of pedagogical, andragogical, and heutagogical features	All the possible learner support identified and curation tool	All the possible learner support identified	All the possible learner support identified

Table 2.6 shows possible learner support for each type of MOOCs. Due to lack of studies on the nature of learner support for each type of MOOC, the pieces of information in the table are logically inferred from the learning environment described for each type of MOOC. As the emerging PAH-based MOOC is relatively new and yet emerging, studies on appropriate learner support are almost nil.

It can be drawn from the table that instructor support becomes less engaging from xMOOCs to cMOOCs, but this may reflect the changing role of teachers and shifting focus from teachers to learners. On the other hand, learner support increases from xMOOCs to cMOOCs, reflecting the increasing autonomy of learners. For the xMOOCs, content support is essential as the main purpose is content acquisition. Therefore, the tools for sharing content are indispensable. Videos made by the teachers or videos downloaded from YouTube or any similar websites are the common means for content transmission. Assessment is also an important element of xMOOCs, thus tools for assessment are essential for feedback given to the learners. For the cMOOCs, the learner support (content support) is a critical element as the learners have complete autonomy over their learning. Here, students need all the support to search, collaborate, connect, and reflect on their learning. Without these tools, learners may experience challenges in knowledge formation. The PAH continuum-based MOOCs, all the learner support activities are essential as the MOOC transitions from pedagogy to andragogy to heutagogy.

The attempt to identify the learner support strategies in MOOCs is systematically done by drawing from what the designs demand or warrant based on the theories of learning. It could have been done by culling from studies on learner support in MOOCs. Publications on MOOCs typically do not emphasize learner support. The reason mentioned by Zhang et al (2018) is the lack of experts on instructional design. The most cited themes are "assessment including feedback" and "forms of learning." (Gregori, et al, 2018). There are no studies relating design of learning environment with appropriate learner support in accordance with the theories of learning on which the MOOC is based. There is a need for further studies on how these learner supports be designed to engage learners in the MOOC.

Thus, this research aims to try-out and determine the effectiveness of selected learner support strategies created based on the PAH continuum.

Research Questions

To address research gaps in learner support in MOOCs and other related literature, this research asked the following questions adopting the conceptual framework presented above.

1. What are the existing learner support systems in MOOCs? (a. Which of the following fall under pedagogical, andragogical, and heutagogical approaches? b. What is / are the common approaches being used in MOOCs?
2. What are the essential features and factors to be considered in learner support for MOOCs following the integration of PAH approaches?

3. How efficient and effective are the PAH integrated and designed learning support systems for the MOOC learners?
4. Which features of the integrated pedagogical, andragogical, and heutagogical (PAH) approaches are effective in supporting a MOOC learner?

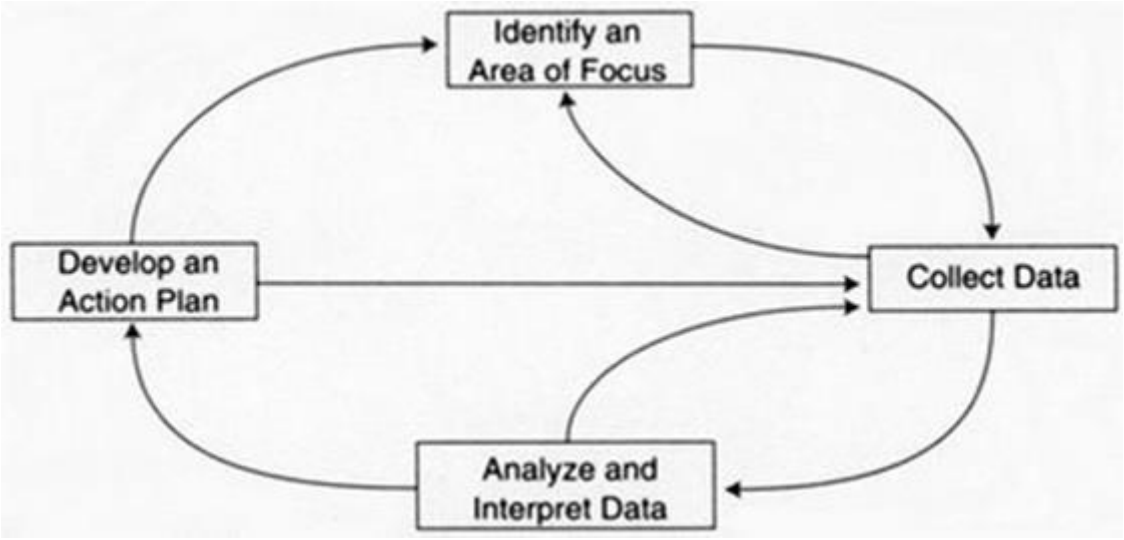
To answer these questions, action research was adopted as a main approach. The essential aspects of the action research are discussed in the succeeding section.

Action Research in Education

In education, the idea of action research is not new. The theoretical roots began in the early parts of the 20th century when practitioners were considered as intellectual leaders and who were encouraged to explore and conduct research in their settings. Dewey's recognition of the central position of teachers in reforming education was a pivotal role. Dewey, who was highly critical of the separation of knowledge and action, encouraged and argued that educators need to test their theories and put their emerging theories into action. Corey, in the 1950s, introduced action research in the field of education. He coaxed that educational change will not happen unless practitioners are involved in the process. This was short-lived, and soon teachers were then again pushed into background. In the 1970s, Lawrence Stenhouse coined the term "practitioner researcher" about teachers being engaged in research to improve their practice.

Figure 3

The Dialectic Action Research spiral (adapted from Mills, 2011, p.19)



A qualitative action research design was employed for this three-study research. Action research has been widely used in various settings from government institutions to private organizations. In the field of education, action research is likewise being used and many authors have recognized its effectiveness (June, Yaacob, Kheng, 2014) as well as its importance in pedagogy (Price, 2001). The Mills' model has four steps: Identify an Area of Focus, Collect Data, Analyze and Interpret Data, and Develop an Action Plan (see Figure 3). Mills' model was chosen for this study as it allows the researcher to be able to actively collect data and then present an action plan for the next study during the research process, and it was more straightforward and fairly easy-to-follow compared with other models.

Chapter 3 Study One - Exploring Learning Support Systems

This chapter briefly introduces the objectives of Study One, the Pilot Study. It proceeds by describing the context and participants of the study. Then it proceeds to describe the methodology used to collect and analyze the data for the study, present the results of the expert review questionnaire and interview and describes the existing learner support in MOOCs. Finally, the chapter ends with a discussion of the main findings in Study One.

Objectives of the Study

Study One (Pilot Study) aimed to examine existing learner support systems in MOOCs via the analysis of learning support systems of existing MOOCs and expert review survey questionnaire (ERSQ). Specifically, it answered research question: What are the existing learner support systems in MOOCs? and the two sub-questions: Which of the following fall under pedagogical, andragogical, and heutagogical approaches? What is / are the common approaches being used in MOOCs? What are the essential features and factors to be considered in learner support for MOOCs following the PAH approaches?

Context of the Study

The field of MOOCs, ODL, and DE mostly overlap hence for Study One experts were chosen from the pool of academics engaged in these areas as well members of open education institutions, MOOC providers and open universities. The experts were initially chosen based on the following considerations: a) top and principal investigators

in ODL, MOOCs, and LS in MOOCs; b) first five to ten authors of the most popular and most hits articles on LS in MOOCs; and c) members of leading organizations in MOOCs. A challenge however was eliciting quick responses hence the criteria had to be adjusted that now included other active experts in the academe, online education institutions, and even the MOOC industry. In addition, researchers and doctoral students and candidates were also elicited to be part of the expert pool.

Participants of the Study

The participants for the Pilot Study were 18 experts (professors, practitioners, researchers, PhD candidates, and PhD students) in the field of DE, ODL, MOOCs, and learner support. Table 3.1 presents demographics of the experts who participated in Study One.

Table 3.1
Demographics of Participants in the Expert Review in Study One

Study One	Number	Gender	Occupation
Expert Review	18	7 Male 11 Female	University professor (7) PhD students (3) curriculum developer (1) learning designer (1) Ed Tech entrepreneur (1) Lecturer (1)

Instruments of the Study

Study One analyzed learner support systems of selected MOOCs and utilized an expert review survey questionnaire and interviews. To identify learner support systems of existing MOOCs being offered by various MOOC providers, twenty MOOCs were selected for the initial analysis. In selecting those MOOCs, two points were considered: 1) the selected MOOCs chosen must all be taught in English or at least one of the mediums of instruction being used is English, and 2) the content of the selected MOOCs had to be similar with each other so that comparison was somewhat on equal weight. As a result, four MOOCs in Business Communication and six MOOCs in Business English, were selected. Each MOOC was examined on how its learners are being supported. The analyzed learner support systems were then categorized into pedagogical, andragogical, and heutagogical approaches.

Expert Review Survey Questionnaire (ERSQ)

An expert review was done via ERSQ to confirm whether the types of learner support systems observed in selected existing MOOCs. For this study, an ERSQ was developed based on Gamage et al. (2015)'s 10 Dimensions Model survey questionnaire with the authors' permission, internally tested, and revised accordingly. The ERSQ of the study consisted of the 10 dimensions as found in Gamage et al.'s: technology, pedagogy, motivation, usability, content, support for learner, network of opportunity, assessment, interactive, and collaboration. More detailed questions about learner support were added

and other questions were refined after the pilot testing with 15 graduate students in the field of education and educational technology. The 10 dimensions model used to develop ERSQ is presented in Table 3.2.

Table 3.2

Revised Dimensions and Items Used in ERQS

Dimension	Description
Technology	1) MOOCs should have various media support such as video, audio, and others; 2) whether the MOOC should be offered in at least two languages; 3) whether the MOOC providers should always check what hardware learners have; and 4) whether the MOOC providers should always check what software learners have.
Pedagogy	1) throughout the MOOC, the student should connect and share learning with other students; 2) MOOC should have a single approach/method in providing support to its learners; and 3) MOOC should employ a combination of methods in providing support to its learners
Motivation	1) MOOC should give student/s confidence because they (now) know and understand the concepts; 2) MOOC should be able to keep student/s motivated to continue in the course; and 3) MOOC should give student/s satisfaction in their learning.
Usability	the interface of the MOOC should be easy to follow
Content / Material	1) content used in the MOOC should be highly relevant to the subject; and 2) content used in the MOOC should be updated (and is relevant with the current time)

Support for Learner	1) MOOC should provide psychological support to students; 2) MOOC should provide emotional support to students; 3) MOOC should provide social support to students as cheer ups, help in needs, appreciation; 4) MOOC should provide administrative support to students in cases like credit, system errors, conflicts of answers etc. 5) MOOC should follow a well-defined and easy-to-use process in handling complaints (e.g. of systems, content, interface or any other students or instructor; 6) MOOC should provide gender considerations; and 7) MOOC should consider language considerations.
Network of Opportunity	MOOC learners should support each other by sharing idea and feedback in an active peer network.
Interactivity	1) The MOOC should support learner to learner interactivity. (e.g., messaging, calling, hangouts, forums, meetups); and 2) MOOC should encourage learner to instructor interactions.
Assessment	1) MOOC should always consist of competency forms of assessments. (Directly based on content); 2) MOOC should include a group project or collaboration as an assessment; 3) Various assessment formats like multiple choice questions, essay, artifact submissions, and portfolio, should be used; 4) Regular personalized feedback should always be given to students; and 5) MOOC should provide enough feedback for my learning. (Formal or informal by peers, TA, instructors).
Collaboration	1) MOOC should provide a venue or a collaborative space in which to work with other students; 2) MOOC should have opportunities to collaborate with instructor and co-create content. (That is, the instructor asking questions and prepare review of summary incorporate in the class); and 3) MOOC should connect with the community.
Learner Autonomy	1) time they want to study; 2) what they want to study; and 3) how they want to study

Once they were selected, the experts were asked to answer the ERSQ, (online version on SurveyMonkey) link sent via email or QR code. The ERSQ also included the research consent form. Confirmation, if needed, was done via email and/or Skype is.

Data Collection

Study One was conducted between September and December 2018, the ten MOOCs that were selected based on convenience and purposive sampling, meaning immediate MOOCs that met the initial criteria were first analyzed to identify their learner support systems. The analysis of content descriptions on the MOOC websites was conducted. Eventually, several existing learner support systems were identified and categorized by the researcher into three types (pedagogy, andragogy, and heutagogy) for the experts to confirm. An online version of the validated ERSQ instrument which was developed based on the 10 dimensions (are technology, pedagogy, motivation, usability, content/material, support for learner, network of opportunity/future direction, interactivity, assessment, collaboration, and learner autonomy) model was distributed to the 18 experts in the field of distance, online education. In addition, a short interview with each of the experts was done via Skype or email correspondence to confirm their responses.

Data Analysis

Data collected from the expert reviews in Study One were analyzed using construct and thematic analysis approach. Interview data collected from the participants in Study One were analyzed using construct and thematic analysis approach.

Findings of Study One - Exploring Learning Support Systems

Research Question 1: What are the existing learner support systems in MOOCs?

Study One (Pilot Study) addressed RQ1 and aimed to establish which among the learner support fall under pedagogical, andragogical, and heutagogical approaches. Finally, it also aimed to find out the common approaches being used in MOOCs. Overall, the ten dimensions elicited positive responses from the experts. The experts recognized technology as a vital part for learner support in MOOCs; however, the degree of importance seemed to vary. In the pedagogy part, experts acknowledged the importance of connecting and sharing learning with other learners, which has been one of the strong points of MOOCs. Emphasis on not a single approach but employing a combination of methods and approaches were likewise stressed. All the items in the motivation dimension have no responses under disagree and strongly disagree. Motivation, whether intrinsic or extrinsic, remains to be a consistent factor in MOOCs as agreed upon by experts. Whether it be confidence and/or satisfaction in their learning, it remains to be a significant feature of learner support in MOOCs. Similarly, usability had no negative marking. The responses of the two items in the content / material dimension revealed agreement in relevance and up datedness of the MOOC topics.

For the support for learner dimension, what was emphasized is to how non-academic support are strong factors for the success or non-success of MOOC. While

it has not been established whether the effect is causal or otherwise, it is of vital importance to recognize its significance in the bigger MOOC context. Another interesting aspect under this dimension is gender wherein, based on the responses, gender has been not much of a factor among MOOC learners. The dimensions of interactivity and network of opportunity dimension, both had high positive responses hence reflecting the need for continuous interaction, connection, collaboration, and networking among MOOC learners. All items in the assessment dimension except for item 2 had mostly agree and strongly disagree responses. Item 2, emphasizing having a group project as an assessment, had 7 out of 18 (38.89%) responses for neutral and 6 out of 18 (33.33%) for disagree. The results reiterated the need for varied assessments.

Among the three items in the collaboration dimension, items 1 (providing a venue to work with other students) & 3 (connect with the community) have similarities in terms of the number or responses with most leaning towards agree and strongly agree. On the other hand, Item 2, had 9 out of 18 (50.00%) responses agree that MOOCs should provide collaboration with instructor while 7 out of 18 (38.89%) answered neutral in the question. The responses seem to indicate how working with peers and even with the community are being practiced and supported by MOOC providers. However, it was interesting to note that collaboration with the instructor remains a point for discussion. This seemed to explain and support some MOOCs' approaches who still herald the instructor as the main subject matter expert. Finally, the items in the learner autonomy

dimension had similar trend of responses more towards agree and a same (item 3) or higher number of responses for strongly agree (items 1 & 2). The results do confirm many studies sayings that one of MOOCs strength is the opportunity of learners to be able to control what and how they want to learn and even when they want to. The results indicate how all these dimensions albeit varying in intensity and significance, are important and vital in providing support to the learner.

Learner Support for MOOCs Framework

In the second and more specific dimension, the experts were asked to provide their comments on the framework as shown on Figure 2.3. There were only two tasks/questions in this part: 1) provide their general comments on the initial framework presented and 2) give more specific responses and examples as to whether, in their institution and/or basic knowledge, as well as if there are other forms of learner support not included. Most of the experts commented that the questions seemed parallel responses.

Nine out of 18 (50.00%) skipped the first question. For those who responded, the answers may be categorized into three: 1) no comments or unsure about their own background about the question; 2) confirmation (questions or clarifications) of some aspects of the framework; and 3) constructive points on the framework. The second category included setting a working definition for learner support and had confusion with terms like accessibility vs adaptability. In the former, accurate definition can provide a clearer image to what is the context of the study. As one expert stated, “the image seems

to try to encompass the totality of a MOOC development and implementation framework." Similarly, it was pointed out that there could be a general term like "technological support" that may be needed by learners for software concerns, hardware concerns, connectivity concerns, general computing concerns i.e., like a prerequisite set of skills is necessary as a base. In such a case, "technological support" is different from accessibility support in this environment. A few experts pointed out other specific categories of learner support that should be included and considered. One expert noticed the missing role of the instructor / tutor and peers as well as the learners' personal learning environment (PLE). Another expert also pointed out that "financial support" be included because there are some MOOC providers who give students a 'lower rate' when they do not pay for the certificates. Additionally, another expert also pointed out that language support should be included too. Some experts also raised some questions and gave comments on some of the items. One expert asked whether MOOCs have the role and/or can provide affective support. In this category still, three out of the nine responses (33.33%) reflected that the support depicted is similar and generally reflective of what their institution provides. However, one expert pointed out that in their institution, Facebook and Twitter were not being used as possible means of cognitive support. Another expert commented that the framework was helpful and straightforward.

In the third category, five responses out of 18 provided detailed points regarding the framework. One key point highlighted was accessibility, cognitive and reflective

support is very critical and have prime importance. Renaming some terms and expounding were additional comments. For example, one comment stated that cognitive support can be renamed as "instructional support". Another expert provided an alternative classification: social, pedagogical, managerial, and technical. These support systems should be ably supported by their respective MOOC providers. Similarly, the subcategories under the affective support seemed vague so revising or renaming might be more useful. Besides, a suggestion to provide more specific labels about the kind of support they are offering was given.

Another key point that was stressed was the possibility of an overlap to exist among the learner support systems. For instance, a "discussion forum with peers" can not only provide affective, but also cognitive support if questions of understanding are elaborated. This was reiterated by another expert when relationship among factors in the model be reviewed. Another aspect that may be explored in terms of learner support is feedback for open assignments and relationship with the instructor. The expert expounded that their institution offers these forms of support in addition to interactive and synchronous webinars. Lastly, another expert commented on the design of the model, “that every support is independent from each other.” He emphasized that it might be possible they are somehow interrelated. He also suggested other ways in presenting a visualization of the model by exploring linear or circular forms or means of connecting the factors and constructs.

Moreover, additional categories in learner support for MOOCs were suggested such as technological support and communication, as it is such an important part of the MOOC experience. One expert did point out though that she is not sure that reflection should be a separate category. She further added, "reflection cannot be taught or mandated: it can, however, result from careful and effective course design and facilitation." Furthermore, another expert highlighted the question as to whether MOOCs should have the role and the ability to provide affective support. In the sub-topics, a few experts suggested to include more specific areas like types of feedback and peer feedback and synchronous webinars (recorded on topics defined by students). Another expert also added that her institution provides career support, or more precisely, guidance for career improvement although she did say it may also be useful for ODL learners. Lastly, clarification, explanation, and more examples on reflective support, MOOC descriptions (whether self-paced or not), and communication activities within the MOOC (mobile mail, mobile number, and FB page).

Summary

Overall, these two questions gathered feedback from experts on their general comments on the framework depicted and specific points that may exist in their respective institutions or based on their previous and existing knowledge and experience. The key points are to 1) define, clarify, and rename (if needed) the terms being used; 2) add categories to the existing framework; and 3) provide specific and concrete examples in

each sub-topic These suggestions were then added and placed into the framework to make a new one, an elaborated framework of learner support for MOOCs.

Chapter 4 Study Two – Confirming Existing Learner Support Systems

This chapter introduces the objectives of Study Two followed by describing the context and participants of the study. Then, continues to describe the methodology used to collect and analyze the data for the study. Finally, the chapter ends with a discussion of the main findings in Study Two.

Objectives of the Study

Study Two aimed to check whether these learner support systems identified in the Pilot Study do exist in a distance learning education platform that is like a MOOC. It was more confirmatory in nature and the data collection was done through interviews with students from the course as well as the instructor.

Context of the Study

The University of the Philippines Open University (UPOU) is the Philippines' top university, University of the Philippines' response to the "perennial challenge of providing quality higher education to a growing population distributed in over 7,000 islands". It was established in 1995 by the eventual convening of three major events including introduction of rural educational broadcasting (1964), completion of Science Teaching Using Distance Instruction research project (1988) and implementation of the Distance Education Program (1991). Since then, UPOU has remained in the forefront of providing distance education services in Southeast Asian region. Since its foundation, UPOU has been offering degrees

from Associate's to Doctorate to students all around the globe. Apart from its prestige and stature as the main proponents of DE in Asia, the language used in instruction that is, English, allowed conducting of interviews and analysis of related documents. In addition, all the previous learners were all Filipino hence, if need be, they, as respondents, were able to interact with the researcher in Filipino.

The online course entitled "N-230: Primary Care of Women" aimed to provide current knowledge and advanced skills necessary for a clinical nurse specialist to manage health maintenance and non-life-threatening conditions specific to women throughout their lifespan. The course was divided into 12 modules and offered from January 26, 2019, until May 4, 2019. Students are expected to check the weekly tasks on a regular basis.

Participants of the Study

The participants for Study One were former students of the DE course titled "N-230: Primary Care of Women", and the course instructor. The participants and the instructor were all Filipinos. In addition, they were all nursing professionals and located in various locations apart from the Philippines. The instructor, however, is based in Metro Manila, Philippines. The respondents were adults, with some working and currently pursuing graduate studies in the open university. The respondents were 14 adult learners who may either be self-directed learners or self-determined learners. xMOOCx are based on pedagogical and andragogical approaches and designed for self-directed learners, while

cMOOCs are based on heutagogical approach for self-determined learners. These approaches, P, A, H are the main determinants of the design of the MOOC as discussed in Chapter 2. Based on the design, appropriate learner support systems are determined.

Table 4.1
Demographics of Participants Study Two (n=15)

Characteristics		Total
Gender	Male	1
	Female	14
Classification	Teacher/Educator	1
	Student	13
Profession	Employed	14
	Not employed	0
Age	18-25	
	26-35	2
	36-45	10
	46-55	2
	56-65	
	65 older	
Nationality	Filipino	10
	Not Filipino	1
	Did not say	3

User of MOOC	Yes	10
	No	4
How many times as a user of MOOC	First-time	0
	Twice to a few times	13
	More than five times	1
Geographical Location	Philippines	10
	Outside of the Philippines	4

Instruments of the Study

Study Two employed learner and instructor interviews done via Skype. The questions were previously prepared by the researcher. The set of questions that were prepared and asked to the students and the instructor focused on the learner support systems in their previous course. In addition, their attitude towards these systems were likewise focused.

Data Collection

Study Two which was conducted between January - March 2019, data from learner and instructor interviews were collected to confirm the findings from the Study One. Applying purposive sampling, 14 graduate students in an open university in the Philippines were selected and the interviews were conducted within a period of two months. After each interview, an email was sent to summarize what has been discussed and the researcher

requested for some confirmation from the participants. The results of Study One along with recommendations by the experts in the Pilot Study were used to determine the revised list of learner support and its features. In addition, Martin's framework (Martin, et al, 2018) which highlighted the key concepts of self-autonomy, growth in competence, and relatedness was integrated into the final list of learner support systems which was used for Study Three.

Data Analysis

Survey data collected from the participants in Study Two were analyzed. Interview data were analyzed using item coding as well as following the construct and thematic analysis approach. After the interview, concepts, constructs, and themes drawn from the utterances of the different stakeholders were analyzed. From the utterances, concepts or codes representing the broad unit of information from the utterances were abstracted. They best describe the information and match the text regardless of the length of the database (Creswell, 2013). The identified concepts were further analyzed by classifying the dimensions of information. Common and related ideas represented by concepts were grouped together constituting the constructs, also referred to as subthemes or categories (Creswell, 2013), which represent the dimensions of the ideas aggregated from concepts. They serve as the larger unit of ideas where concepts were subsumed. Constructs represent the dynamics of the concepts and constitute the themes. The themes represent the

dynamics of constructs. The participants' perspectives of relevant, appropriate, and responsive MEP were gleaned from the themes.

Findings of Study Two

Research Question 2: What are the existing learner support systems in MOOCs?

Table 4.2 presents the learner support identified in Study One which are existing in the open university and what does each learner support provide.

Table 4.2

Learner support existing in current MOOCs

Learner Support in Study One	Existing in current MOOCs in the university	Learner Support that exists in the current but not in Study One
1. Video	Yes	
2. Discussion board / online forum	Yes	
3. Virtual reality	No	
4. Search engines	Yes	
5. No	Yes	Facebook Live sessions

The course in the UPOU where the respondents was enrolled is assumed to be of the xMOOC type. It is assumed that much of the learner support are for interaction with content and for establishing connections with other students and instructors. From the table, it could be validated that the following learner support systems exist in the

open university. In addition, the means of support that was present in the open university but was not from the pilot study were Facebook live sessions. The researcher was unable to confirm whether this happens in the list from the pilot study. Therefore, it can only be concluded that they were being used in their class in the open university as it was the easily accessible format among the students then currently taking the class. It was unclear whether this mode was common in other classes in UPOU or in Nursing or in classes by that professor only.

Features of the Learner Support used in the OU

Table 4.3 present the results of the analysis of the interview using the concept construct theme (CCT) technique. Based on the utterances, concepts were identified; from the concepts, constructs are determined and from constructs the themes. The respondents in the interview are not new to MOOCs since this is the main modality for them to get their education. It is assumed then that they are adult learners, with some being self-directed and others as self-determined learners. These types of learners are the focus or the main consideration for types of MOOCs, which are founded on theories and associated approach applicable to young learners, adults (self-directed) and adults who are self-determined. MOOCs are designed following the pedagogical approach; or andragogical approach or the heutagogical approach. What these respondents shared are based on their personal interactions with the MOOC.

Table 4.3

Perceptions on learner support system

Concept	Construct	Theme
Video	Important learner support in MOOC	Backbone of MOOC
Virtual reality		
Discussion board		
Search engine		
Helpdesk		
Interactive		
Reliable and dependable information		
Short but concise		
Well organized; logical sequence/presentation		
Real world examples		
Feedback		
Additional readings		
Visually attractive		
Repeated access		
Free of any restrictive guidelines		
Availability of various means (not only one option)		
Options to know other learners	Preferred features of learner support for connection	Essential elements of learner support for MOOC adult learners
Available means for collaborative learning or group work		
Friendly tone		
Unlimited access to course materials		
Learners' preference for activities		
Submission of outputs	Features that promote self-autonomy	
Self-pacing		
Available feedback		
Several options		

Essential Elements of Learner Support for MOOC

This is the main theme extracted from the CCT analysis. The participants expressed their ideas drawn from their interaction with different MOOCs that any MOOC should have learner support for content dissemination, connection with instructor and/or staff, and classmates, if needed, and promotion of self-autonomy. Content dissemination is an important function of MOOCs whether they be of different approaches. In face-to-face, knowledge sharing or dissemination (either content and process or both) is the responsibility of the instructor. The main strategy is to lecture. In ODL platforms and MOOCs, the typical way of knowledge dissemination is through a support in the form of video recordings, readings (e-handouts, e-books, etc.) or link to an online resource material. For this learner support to be effective, it should have reliable, dependable, and relevant information. In addition, it must be well-organized and logically sequenced, and examples are drawn from real world. Moreover, preference is with short but concise materials. The provision of additional readings is very much appreciated. Lastly, the materials should be visually appealing.

Support for connection is considered equally important. In MOOCs and similar ODL platforms is the physical distance. The learning process is perceived to be done by oneself however, immediate connection especially to instructors and other learners is valued. As some respondents claim, “Greatly appreciate having a chance to connect. I don’t feel that I am alone. It is encouraging to know that there is help plus immediate

support." In the interview with the instructor, she emphasized that she makes sure that she replies to any concern within 24 hours or at least acknowledges any question sent. Connection also connotes communication of ideas without fear of judgement. Personal concerns may be directly communicated to the instructor or some learners. Otherwise, learners can post any ideas. This encourages free thinking and sharing which may enrich the other learners too. However, availability of other means is appreciated to suit personal preferences of individual learners. Collaborative learning or doing group work seems limited in MOOC due difficulties in creating a group due to conflict in free time. In cases where collaboration is possible, it is valued as it promotes better engagement and motivation.

Another construct on the feature of learner support to promote self-autonomy. For the respondents, it helps them to be engaged if they can choose the activities that they can work on. Having a sense of control over their learning makes them own the learning. If they have a sense of propriety of what they learn, they are more motivated and have a stronger sense of accomplishment. The self-paced nature of the MOOC strengthens self-autonomy. A couple of participants said, "Great to do things at my own pace. It relieves stress as I can balance my work and my learning. I can accomplish more especially when I do not have work. I learn to manage my time wisely." To promote the sense of self-autonomy, learner support should have features that would allow access to course materials

anytime; have a flexible time for submission of outputs; and available feedback when challenges arise.

Self-paced learning gives autonomy. Easy navigation also allows a student to have control on the platform. Reasonable deadlines and clear direction allow the necessary adjustments in doing tasks at hand. Having feedback from instructors gives a sense of how much one has achieved and how much more to achieve. Moreover, several options and choices in doing things gives broader latitude in making decisions and working on tasks at hand.

Another theme identified is the backbone of MOOCs. This is in reference to respondents' perception of the importance of learner support to MOOCs. The identified important learner support includes video, virtual reality, discussion board, search engine and helpdesk. For the respondents, without these learner support, the learning process would not be effective. Some responses that highlight this point are: "My (student) life depends on them (learner support). Everything that I need is with this learner support." If there are no learner supports especially the videos and readings, it will be very difficult."

Effective Learner Support System

There are two themes related to effective learner support, namely, the preference on the features of common learner support and the essential learner support for self-

determined learning. Most of the current courses attended and being attended (at the time of the interview) by the respondents are based on pedagogical and andragogical approaches and as such may not have learner support for MOOCs that are designed based on heutagogical approach or self-determined learning.

The first theme is on the features of the common learner support found in MOOCs that are familiar to the respondents. As previously mentioned, videos, virtual reality, e-readings, discussion board, search engines and helpdesk are among the learner support encountered and preferred. Though not found in this list of technology-based support, instructor support has been described and discussed as an important and indispensable support.

The responses focus around three significant constructs, namely, preferred features of video materials to include virtual reality, of e-readings and of instructor support. These are crucial as claimed by respondents. To emphasize this point, here are some statements: “Videos, e-readings and instructors are main ingredient of a MOOC.” “Main support needed. The others are auxiliary only’.

For video materials, they should be short (around three to seven minutes), interactive, with embedded quiz, in friendly tone, have real life examples, and unlimited access. Most participants also added that the videos can be accessed even in offline mode. Short videos are better or rather, much preferred. It is easy to capture the main points and

the interest is sustained. If it is a long video, the focus and attention can drain to the point that one would not like to finish it. “I feel sleepy at the middle of a long video.”

Moreover, the visually attractive and interactive nature of the videos keeps the learners focused on the materials. Attention is captured which can be translated to engagement. Being engaged with the MOOC in general helps the learners complete the MOOC. The friendly tone of the learner's support like the videos, reading materials and instructions are encouraging and stimulating. In addition, having engaged and stimulating activities and interactive platforms allow active learning, which heightens engagement and motivation in the MOOC. This pronouncement is very much related to the features of learner support with content resources. For content presentation learner support, preferred characteristics include embedded quizzes, reliable information, additional resources, well organized content, relevant examples, and task involvement. Videos with embedded quiz give immediate feedback as to the level of understanding of the learner. If the feedback is not good, the learner will immediately go back and review and see what part they did not understand. The unlimited access to the video allows the learners to review the materials until they fully understand the content. This gives the learners a sense of autonomy over their learning. Finally, real life examples provide the relevant context of the content. In this higher level and more specialized course specifically, this helps in better understanding the applicability of the content in real life situations. The complete list of Perceptions on ‘What is an Effective Learner Support System is in the Appendices.

Another construct is the preferred features of readings, which are intended to provide essential information (principles and theories). These may have the same function as the video. The difference lies in the scope that the videos provide the synopsis or summary of major ideas while the readings provide the detailed explanations. Readings are preferred to be logically organized, expertly written, easily understood and downloadable. Whether face-to-face or online, the quality of the reading materials is very critical. So, the preference for logically organized, expertly written, and easily understood are equally important for online learning. These features help the learners save time devoted to understanding the materials. Moreover, being able to download the materials allows the learners to fix their schedule to work on them. Adult learners assert that having several options for activities allows them to work on something more interesting to them. The additional readings help in the same way. Just as with videos, integrated feedback of embedded assessment is helpful in tracking their level of understanding.

Instructor support is still considered indispensable in MOOC. If in the face-to-face set-up, presence of instructor is critical in implementing the academic program. In MOOCs, instructors, may have different and various roles, are still indispensable to a certain degree. While the learning environment is designed for self-learning, the instructors considered as subject matter experts are needed for valuable advice and support to be successful in the learning process.

The second theme is on the essential learner support for self-determined learning. While the respondents are more familiar with MOOCs that are founded on pedagogical and andragogical approaches, several of them describe what else they desired features of learner support that is more associated with self-determined learning. These are learner support for connecting with others, experts, and other learners; for communicating outside the MOOC "classroom"; for doing own project outside the MOOC classroom; for free expression of ideas. "I think it is fun to do my own project." "Going out of the box brings out my creative juices."

These features may seem like that of the popular MOOCs but the desire to do own project and connect with people outside the MOOCs are associated with self-determined learning. Having the opportunity to connect and network with other individuals within and outside the MOOC is helpful in enriching the learning process. It opens opportunities to listen to other individuals.

To be more specific, the VR as a learner support can be utilized by highlighting its features like self-autonomy to support a learner's own pace while learning, real-life experience, testing their creativity, as well as room for networking and collaboration.

Summary

To summarize, the common learner support system identified that are used in MOOCs includes video, discussion board, e-readings, search engine and helpdesk. In addition, the learner supports are considered the backbone of MOOCs as they support

content dissemination, connection (communication) and promotion of self-autonomy. These correspond with the basic functions of MOOCs that are based on the pedagogical and andragogical approaches. Also, the characteristics of learner support for content dissemination are short but concise, well-organized, reliable and dependable information, have real world examples, have additional readings, visually attractive, interactive, and has feedback. Moreover, learner support for connection (communication) are effective if it has free environment for sharing (guidelines are not limiting), provide several options to link to communicate or connect with other learners and instructors, has support for collaborative learning or group work, and has a friendly tone. Fifth, learner supports for self-autonomy are considered effective if there is unlimited access to course materials, the learners have option to do preferred activities, and it is self-paced learning. Sixth, the preferred features of video are short, interactive, has embedded quiz, delivered in friendly tone, has real life examples, and has relevant content. Seventh, for readings/e-readings, the preferred features are logically organized, expertly written, easy to understand, have several options for activities, have integrated feedback, have additional readings, downloadable, and have real life examples. Eighth, instructor supports are considered effective if they provide immediate responses, provide useful suggestions, are encouraging and accommodating, recommend other relevant resources, and are subject matter experts. Lastly, a desired learner support is for the promotion of self-learning that has the following features: has provisions for free expression of ideas, permits learner to

do projects that are interesting to the learner, has provisions to connect to learners and other experts outside the MOOC, and encourages learners use other means of communications to connect.

Chapter 5 Study Three: Effectiveness and Efficiency of the Learner Support for MOOC

This chapter briefly introduces the objectives of Study Three, which is comprised of two phases: Phase One, Pedagogy-Andragogy (P-A) Study, and Phase Two, PAH Study. It proceeds by describing the context and participants of the study. Then it continues to describe the methodology used to collect and analyze the data for the study, present the results of the expert review questionnaire and interview and describes the existing learner support in MOOCs. Finally, the chapter ends with a discussion of the main findings in Study Three.

Objectives of the Study

The objective of the first phase of Study Three, (P-A) Study, was to confirm how efficient and effective are the P-A-based and designed learning support systems for the MOOC learners. It also sought to identify which of these learning support systems were efficient and effective to the MOOC learners. On the other hand, the objective of the second phase of Study Three, P-A-H Study, was to confirm how efficient and effective are the P-A-H based and designed learning support systems for the MOOC learners. Moreover, it aims to also find out how efficient and effective are the PAH integrated and designed learning support systems for the MOOC learners. Lastly, it also aims to know which features of the integrated pedagogical, andragogical, and heutagogical (PAH) approaches are effective in supporting a MOOC learner.

Context of the Study

Study Three Phase One, P-A Study, was conducted with voluntary participants of a trial MOOC on Sustainable Forest Management offered by University of British Columbia in Canada in collaboration with the University of the Philippines. The researcher worked closely with the instructor of the MOOC while acting as an action researcher at the same time. The MOOC modules that comprised this study began from May 11 - 31, 2020. It covers the following modules: Course Orientation, Module 1.1, and Module 1.2. Invitation to register and enroll in the MOOC were sent out. There were 22 learners who officially joined the MOOC.

Study Three Phase Two, P-A-H Study, was conducted with voluntary participants of a trial MOOC on Sustainable Forest Management offered by University of British Columbia in Canada in collaboration with the University of the Philippines. The researcher worked closely with the instructor of the MOOC while acting as an action researcher at the same time. The MOOC modules that comprised this study began from June 8 - 28, 2020. It covers the following modules: Module 2.2, Module 2.3, and Module 2.4. Most of the learner participants in Study 2 were still part of the class but a few were no longer active.

The topic of forest ecosystem was chosen because of its universality and significance in society. Individuals from different parts of the world can relate to this topic, whether they have a forest ecosystem or not. The MOOC integrated and provided the

learner supports that were created based on the final list of learner support and effective features.

Participants of the Study

The participants of phase two Study Three were 22 voluntary learners who responded to the MOOC invitation. They were from the Philippines, Japan, Vietnam, Mali, Chile, Indonesia, Singapore, and USA. I took the responsibility of the MOOC instructor and played a role of the action researcher-collaborator. Table 3.3 presents key features of the 22 learners who participated in Study Two. In addition, more than half of the respondents have taken a MOOC or an online course before. And among those who responded yes, 3/4 have taken 1-3 courses, while the remaining ¼ have taken 4 or more courses.

Table 5.1
Demographics of Participants of Study Three

Characteristics		Total
Gender	Male	8
	Female	14
Age	18-25	
	26-35	18
	36-45	2
	46-55	
	56-65	
	65 older	
Educational Background	Doctorate level	4
	Master's level	11
	Bachelor's level	7
	Secondary school level	

None of the above
Prefer not to say

The participants of Study Three were those 12 learners who voluntarily stayed through Study Three However, from the total respondents from the Philippines, Japan, Vietnam, Mali, Chile, Indonesia, Singapore, and USA, six learners remained active.

Instruments of the Study

Both phases of Study Three, had employed a survey questionnaire, interviews with selected learners, and my own observation as an action-researcher.

Selection of Learner Support for P, A, H approaches for MOOCs

The MOOC is designed to have two modules with each module having three weeks each. The design of the two module is slightly different in approach. Module 1 was based on the pedagogical and andragogical approach (PA); while Module 2 was based on integrated pedagogical, andragogical and heutagogical approaches (PAH). Based on the approaches on which the modules are founded, appropriate learner support is determined and developed. For both modules, the learner support are the videos, module notes (readings), online forum and instructor support; however, Module 2 has virtual reality. Below is the summarized information about Module 1 and Module 2. After developing and designing the MOOC, the next step is to assess the effectiveness of the learner support in contributing to the completion of the Modules by the participants.

Data Collection

Study Three Phase One (P-A Study) was conducted between May 11 - 31, 2020, a MOOC was designed and developed based on modules that were already developed by experts on Forest Ecosystem. After implementing the MOOC to twenty-two learners from UPOU, survey and interview data were collected from them. Study Three Phase Two (PAH Study) that was conducted between June 8 - 28, 2020, the survey and interview data collected from the remaining active students were collected. During the MOOC, participants' behavior was observed and later, were interviewed.

The MOOC instructor was likewise be interviewed in their overall experience. Participants were asked and observed after taking the MOOC. This study had the researcher-collaborator coordinate with the MOOC instructor from the University of the Philippines Open University's Massive Open Distance eLearning (MODeL). The researcher collaborated with the MOOC instructors to reflect an integration of PAH in learner support for MOOCs. Based on the results, RQ 4 (Which features are effective in supporting a learner integrating pedagogical, andragogical, and heutagogical approaches?) will hopefully be answered. Throughout the various rounds of the study, English was the only language that was used.

Study Three covered assessment of Module 1 (PA approach) and Module 2 (PAH approach). The data gathered for the assessment include the following:

- scores in the embedded quizzes and the number of trials of answering the questions - indicates the level of understanding of the participants of the materials. Data were gathered based on the scores registered and the number of times of trying to answer the questions.
- emails sent to instructions and their purposes - indicates the possible level of engagement of the participants as evident in the nature of the message and purpose of sending the emails. Direct counting and documentation were used.
- posts in online forum of learners - indicates the attempts to connect either to other participants and to instructor or to both. Direct curation of online posting was done. The number of posts was counted and documented.
- survey through email - intended to preliminary perceptions on the effective of the learner support and the features that make them effective.
- interview - provides an in-depth clarification of the responses in the survey.

Data Analysis

Survey data collected from the participants in Study Three were analyzed similarly. Interview data were analyzed following the construct and thematic analysis approach. After the interview, concepts, constructs, and themes drawn from the utterances of the different stakeholders were analyzed. From the utterances, concepts or codes representing the broad unit of information from the utterances were abstracted. They best describe the

information and match the text regardless of the length of the database (Creswell, 2013). The identified concepts were further analyzed by classifying the dimensions of information. Common and related ideas represented by concepts were grouped together constituting the constructs, also referred to as subthemes or categories (Creswell, 2013), which represent the dimensions of the ideas aggregated from concepts. They serve as the larger unit of ideas where concepts were subsumed. Constructs represent the dynamics of the concepts and constitute the themes. The themes represent the dynamics of constructs. The participants' perspectives of relevant, appropriate, and responsive MEP were gleaned from the themes.

Findings of the Study

Research Question 2: How effective and efficient are the PA integrated-based and designed learning support systems for the MOOC learners?

Study Three Phase One aimed to evaluate Module 1 of the trial MOOC. The effectiveness of the learner support is indicated by the level of engagement and motivation of the respondents. Thus, indicators of engagement and motivation are used to infer the effectiveness of the learner support. Among these indicators are the frequency of sending emails to the instructor, the scores in the embedded quiz, submission of assignments and engagement in the discussion board. Short interim interviews of the respondents were conducted after they finished with Module 1 (Weeks 1-3). Module 2 is designed based on pedagogical, andragogical and heutagogical approaches. In view of the results of the

interview for Module 1, appropriate changes were made to address this concern on connectivity. The instructor initiated the suggestion of the participants working collaboratively with the problem. It was a welcome suggestion to several participants as some tried to work together on the problem activity.

Assessment Methods and Results. The assessment of Modules 1 and 2 include number of emails sent, scores in the quiz and number of times, involvement in forum, survey, and interview. The sending of emails to the instructor/facilitator can be an indicator of an interest or lack of it in participating and finishing the MOOC. Appendix H summarizes the number of emails received by the instructor/facilitator per respondent and the purposes of the emails. The initial emails were related to trouble logging in as the platform needed the participants to be manually registered. The other basic email is acknowledgment of the email reminder of the instructor. The other emails sent are meant to: give feedback on activity, provide updates on progress with module, share of personal experience related to module, explain delay, ask question, and express interest.

Integrated in the video are short quizzes composed of 2-3 items. The participant could take the quiz again if they had wrong answers, so it is not surprising to see most of them having high scores. Based on the survey, the learner support that kept the participants working on the module are the videos and virtual reality and readings. This is parallel with the main activities that they did, which were watching videos, doing readings, watching

virtual reality, and searching materials. The problem activity and reading module notes kept some of the participants engaged in Module 2.

Unlike in Module 1, the focus in Module 2 is on the problem activity where the participants work on how this problem could be resolved. The problem topics were according to the interests of the participants. Regarding understanding the concepts, the participants claimed that videos, readings, and virtual reality helped them the most. The virtual reality forest tour was meant to expose the participants to a real feel of a forest. If the module were conducted in face-to-face modality, the virtual reality will be replaced by an actual field trip. Self-autonomy is felt well by the participants because of the self-paced activities and with the instructor not being prescriptive. The instructor in this case seems to be expected to do more of facilitating than providing instructions on what to do. As in Module 1, participants mentioned that the videos were engaging because these were brief but concise, well organized, simple, easy to understand language, and provided only essential information with high quality pictures. As with the readings (module notes), these are considered engaging and motivating because they are professionally written, in simple, easy to understand language, well-organized and logically sequenced. Virtual reality, which is one of the main activities done, helped in making sense of previous learning and providing the context of the concept. Lastly, the instructor support is engaging and motivating when s/he replies immediately and provides necessary and encouraging feedback.

Results of Interview Analysis. The result of the construct and theme analysis of the utterances in the interview revealed two major themes, namely, reasons for persisting in the MOOC and towards a better learning environment in MOOC. For the first theme, the constructs represent the possible reasons for persisting in the MOOC. Participants expressed their perceptions on why they persisted. The three constructs that express the dynamics of the themes are felt differences in the learning environment, engaging learner support and significant learning from MOOC.

Although connection to other participants was encouraged in Module 1, the need to share and connect is more pronounced in Module 2. They found the benefits of collaboration in fulfilling the desired outputs for Module 2, which is resolution of a problem. Consequently, related to focus on sharing is the problem activity. The impact of having to resolve a problem is greater than in Module 1. This is more felt in the readings of content. Virtual reality was obviously a major difference between Module 1 and 2, as it was only integrated in Module 2. VR intends to provide a sense of reality in a forest ecosystem, just like a field trip. As to collaboration, this was made more possible as an adjustment made because of the assessment of Module 1. This was a welcome adjustment as the participants were happy to work collaboratively, although limited due to time constraints, with the other participants. In Module 1, while there was no written instruction that they can just work individually on the problem, the participants hesitated to initiate collaborative work. They were allowed to work as a team or group. Eventually however,

they each worked individually. It was also evident among the participants that the instructor no longer emailed reminders to the participants. She just emailed them in response to their emails. This feature was incorporated to be consistent with the PAH based design of Module 2. Another construct of the theme is engaging learner support. This construct describes the characteristics of the learner support that make them engage. Well-developed videos and virtual reality make them engage. As in Module 1, well developed video refers to brief and concise videos, simple and easy to understand language. Virtual reality, on the other hand, is considered well-developed when this gives a feeling of being in the actual place. Professionally written readings are engaging because these are logically organized, easy to understand and have real to life examples. Responsive and motivating instructor support makes the participants be engaged with the modules. Lastly, having responsive online forum motivates participants.

Summary

Collectively, the number of the emails, online forum interaction, survey, and interview, show the trend that the video, readings, and instructor support are considered effective in keeping the participants engaged in the module. Among the features of the video and readings that make them engage include being well organized, professionally developed and designed, use of simple easy language, with embedded quiz and visually appealing. The instructor support contributes to the level of engagement of the participants, providing the necessary motivation and support. All these learner supports define the

learning environment of the MOOC, described to be like a face-to-face class. The discussion board/online forum is considered important in enhancing the learning experience in MOOC. Any further interaction through the discussion board/online forum can provide additional learning and possibility for collaboration.

The learner support that kept the participants persist in the module are the video, readings (module notes) and the virtual reality. The same features described of effective learner support (video, readings, online forum, and instructor support) in Module 1 is mentioned for Module 2. The participants value the learning experience in Module 2 especially the focus on problem activity that allowed them to collaborate. The opportunity for collaboration on the problem activity is considered a good departure from the usual design of MOOC, which is focused on information dissemination. The learner support is considered effective because they keep the participants engaged in the MOOC activities toward completion.

Chapter 6 Conclusion

The chapter presents a summary of all the studies done and answers each research question. This is followed by contributions, limitations, and recommendations of the study. Finally, a concluding remark to officially end this research was included.

Answer to Research Questions

Study One answered research question 1, What are the existing learner support systems in MOOCs? and sub-questions: Which of the following fall under pedagogical, andragogical, and heutagogical approaches? and What is/are the common approaches being used in MOOCs? The list of answers includes videos, readings, discussion board/online forum, virtual reality, and search engines. Most of the MOOCs that were examined are classified as xMOOCs. As such, the learner support found in these MOOCS are mainly intended to transmit and disseminate content like videos and readings; and for interaction (peer and instruction support), like the discussion board and online forum. Although these learner support systems are used for pedagogical approaches, they are also being used for andragogical and heutagogical approaches in MOOCs.

The difference lies in the overall focus and flow of the learning process. Regardless of the type of MOOCs, the three major interactions found in MOOCs are content interaction, peer interaction, and instructor interaction. If the approach is pedagogical, the focus is on content transmission and peer interaction; on the other hand, if the MOOC is based on pedagogical and andragogical approaches, more attention is given to interaction

and promotion of autonomy. This is in consideration of one important characteristic of adult learners, self-autonomy. For heutagogical approach, the focus is the expansion of self-autonomy, giving freedom to the learners on how to proceed with the learning process. Consequently, instructor support (interaction with instructors) is centered on providing guidance only when necessary. The essential features and factors in learner support for MOOCs following the PAH approach were presented in Table 2.6 in Chapter 2. As to the factors, the main consideration is the approach on which the MOOC is based. The approach defines the features of the learner support.

Study Two answered research question 2, What are the essential features and factors to be considered in learner support for MOOCs following the integration of PAH approaches? Apart from the results themselves, the features and factors were also drawn from the existing theories about the nature of learners. For MOOCs, regardless of the type, the learners are adults, at least undergraduate finishers, and working. The results also support the previously mentioned principles of adult learning theory such as having a say on the content and process of their learning; derived from real-world experiences, which should already be rich due to their experiences; focused on problem-solving, and immediate feedback integrated into the learner support.

Heutagogy is the theory that considers learners as self-determined learners. Some conditions that are consistent with the characteristics of self-determined learners are: exploring a variety of paths and sources of knowledge, learning approaches, e.g., writing,

designing, and drawing, mind maps, collaboration and learning from others, networking with people across the world, and provision for reflective activity. All the identified features are integrated with the design of the learner support systems of the trial MOOC in Study Two.

The research questions 3 (How efficient and effective are the PAH integrated and designed learning support systems for the MOOC learners?) & 4 (Which features of the integrated pedagogical, andragogical, and heutagogical (PAH) approaches are effective in supporting a MOOC learner?) were both answered by Study Three.

For Study Three, the trial MOOC has been considered effective as indicated by the scores in the quizzes, emails sent to instructors, and the engagement in the discussion boards. Some of the indicators of the effectiveness include performing well in the quizzes, consistent email check and update for guidance and clarification, constant use of discussion boards to connect with other participants and completing expected outputs. Moreover, the effectiveness of the learner support systems is associated with how much the participants are kept engaged in the learning process. Although being engaged is not a complete guarantee that the participants will continue and complete the course, engagement heightens the desire of the participants to work on the MOOCs.

As revealed also by Study Three, it is imperative to mention that the learner support systems that were identified for pedagogical and andragogical approaches by the participants include well-designed videos, well-written readings (module notes), effective

instructor, discussion board, and instructor support. The participants also provided features that make each of these learners' support effective. The complete table can be seen in Appendix G, but some effective features are logical scaffolding (of the topics), professionally developed, and simple videos; interesting and relevant readings; encouraging and immediate support from the instructor; an active and collaborative discussion board. The table below summarizes the features.

One area that needs improvement was the opportunity of interacting with other participants and with instructors. Some of the suggestions were to use the online forum for collaborative work; have more opportunities to know other learners through scheduled virtual meetings (although this may pose surmountable challenges when they are thousands of participants) and connect by making available the contact information. The issue with this is data privacy. The first suggestion was considered in revising Module 2 (Study Three Phase Two). For the problem-solving activity, the participants were asked to choose their partners or teammates. Thus, they collaborated on the completion of the project.

Contributions of the Study

Theoretical Contributions

First, the current research has identified PAH integration as an effective approach to the MOOC learner support system. Specifically, a focus in the learner support framework is the learning environment of MOOCs, in which learner support systems are

the integral elements. The design of the learning environment is based on the theories of learning and the nature of learners. The theories of learning and the nature of learners in turn define the approaches in the learning environment. MOOCs may fall under pedagogical, pedagogical-andragogical, or heutagogical approaches or a combination of the three simplified as PAH. Knowing that the MOOC falls under PAH (for example), the learner support systems are designed following these three approaches.

Second, it also elaborated on the importance of designing learner support systems and what conditions for learning under each approach are considered. The effective features of each learner support system like engagement and motivation are then put together in the development process. Making the participants engaged with the learning materials is one of the main considerations in making learner support effective. The concepts with regards to the products and the processes, are important for designers of MOOCs, instructors, and instructor designers. The theories focus on the learners for which the MOOCs are made. Thus, it is important to start with the theories of learning and nature of learners.

Third, it is also highlighting the process on how learner support systems' features are determined. Together with the target learners' perceptions on MOOCs based on their experiences, results of studies on effectiveness of learner supports are considered. Moreover, the results of formative assessment on the learner support are used to revise and improve the learner support while the MOOC is implemented. The product of the design

process, which is the learning environment of the MOOC, is the focus of the framework. When designing the learning environment, it is important to remember that the learner support systems define the MOOCs and play a very crucial role in determining the effectiveness of the MOOC. The learning environment can be likened to the interior of the house and the learner support systems as the furniture and appliances. If the designer wants the interior to have a feel of modern minimalist, then the colors of the room, the furniture and appliances should be selected based on this motif. Putting all these selected furniture and appliances is a creative work; and so, it is with putting all learner supports in the learning environment of the MOOC. Consequently, there can be varied learning environment design and learner support systems.

Fourth, in Chapter 2, the conceptual framework that was used for the research was presented. Below is the revised version of the framework adding new components and right below it is the previous model. It highlights additional key elements like motivated learner partnered with engaged learner leading to MOOC completion. More importantly, the proposed MOOC learning environment framework can be used as a guide in designing and developing learner support systems in the MOOC setting.

The theories of learning and the nature of learners are initially meant to help design the traditional face-to-face learning environment. With development in technology and making learning more accessible and open, ODL and MOOCs have become very good alternative. The distance education landscape has tremendously adapted to changes,

whether in technology, forms of learner support, modalities, and paved the way to new theories, such as connectivism and heutagogy, to create an effective learning environment. The design and implementation of educational programs are dependent on these theories of learning and the nature of learners. Regardless of where learning takes place, for whom, and why, these theories of learning are indispensable. Materials need to be developed, edited, and revised. Whether it is online or face to face, learner support systems are essential; and yet there are very few studies on them.

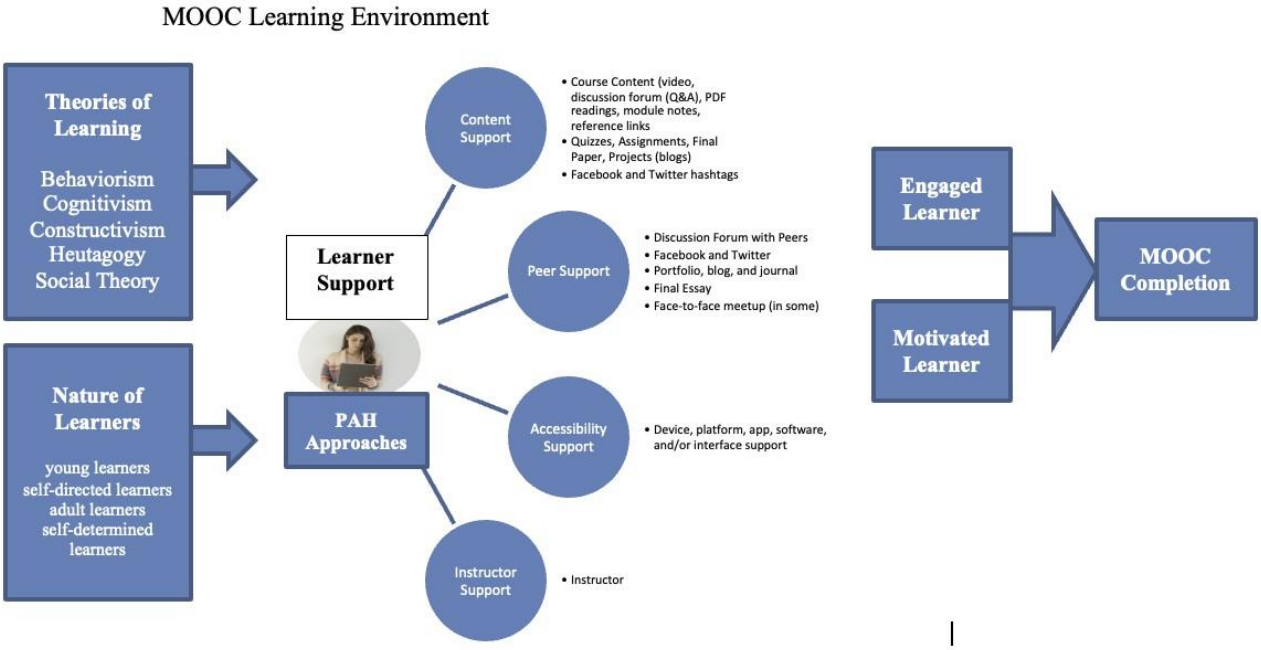
Revised Conceptual Framework

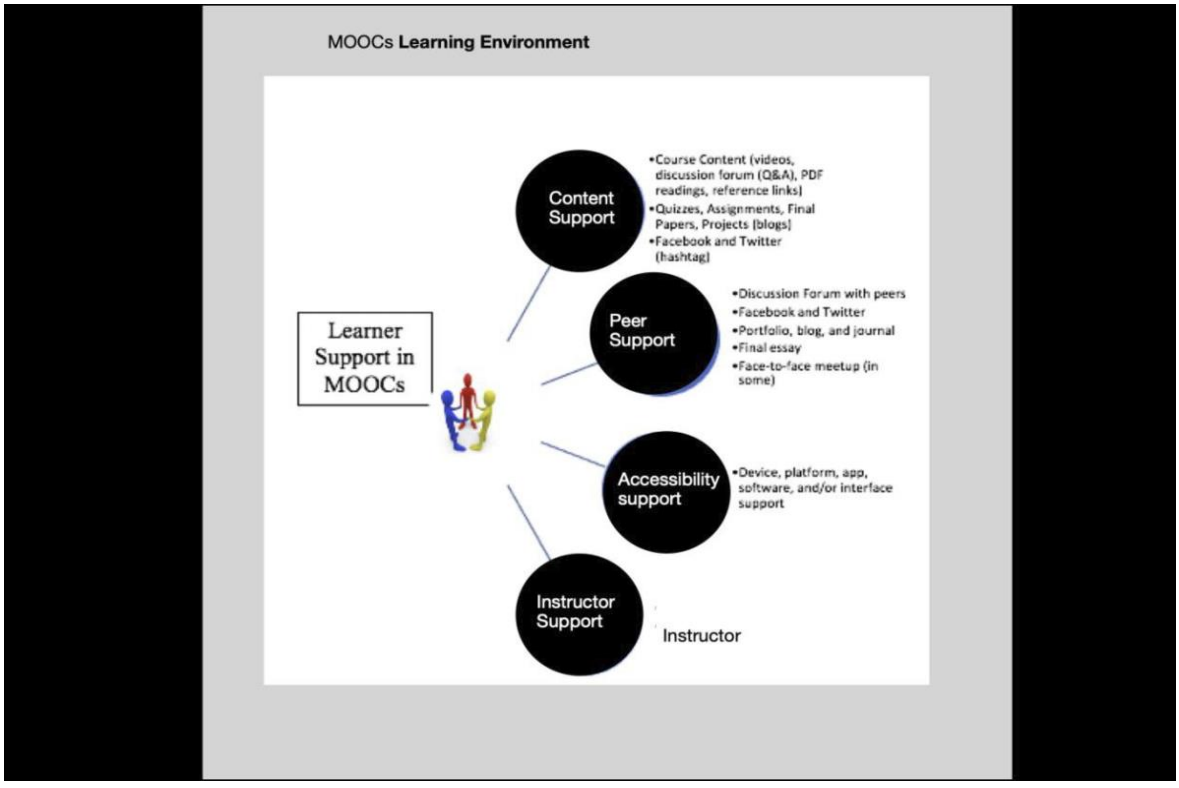
Given all the results from the three studies, it is quite significant to make changes to the initial framework. The findings from Study One laid out the basis on existing learner support in MOOCs. In addition, it clarified which of these learner supports are essential in MOOCs. Study Two results laid the groundwork on identifying and including which learner support must exist for the trial MOOC to be tested for the two phases of Study Three. Combining these results along with the theories of learning anchored and embedded in various types of MOOCs, nature of learners, PAH approaches, a revised framework has been presented in Figure 6.1.

The revised framework also stresses that all these factors lead to having an engaged and motivated learner, which can significantly help in the MOOC completion.

Figure 6.1

Revised Conceptual Framework





Practical Contributions

This research provides MOOC providers and instructors with some practical strategies of learner support. First, it can provide some learner support strategies for MOOC instructors, staff, and providers. Second, it will provide MOOC designers a more specific framework in designing learner support systems as while MOOC is similar with other online institutions and programs, it still has its unique components to recognize. For example, the knowledge and understanding of this framework can help MOOC instructors identify which learner support can be used for a specific type of MOOC, whether xMOOC, cMOOC, or hybrid MOOC. Furthermore, it can help expand an institutions resource and discern which ones work best to coming up with a more engaged and motivated learner. Lastly, the PAH approaches can further be utilized not just in MOOCs but may be adapted in settings wherein there are self-directed learners, adult learners, or self-determined learners.

Limitations

The generalization of the results is subject to certain limitations, which call for further research. First, the context of the MOOC was limited to one topic, the forest ecosystem, which is a consequence of the limited time needed to conduct the study; thus, the participants who were not specifically interested in the topic might have not been fully engaged in this specific MOOC learning. It was also limited to one open university - UPOU, which applies different ways of teaching and learning compared with campus-

based institutions. Further empirical studies with MOOCs in various topics and different contexts (both open and campus-based institutions) are called for to validate the claims of the current study. Second, several of the participants withdraw eventually due to schedule problems and thus only the remaining learners' responses were used in the study. Therefore, the results may not reflect other MOOC learners' evaluation of the PAH approaches to learner support, which suggests further studies on learners' evaluation of the PAH approaches. Third, the use of same platform for content user. The use of different platforms is not possible due to logistical constraints. Moreover, the platform used for the MOOC did not allow for participants to self-enroll and automatically join the class. In several (more than ten) occasions, participants had to email the researcher-collaborator to reset the login information or resend the link etc. These limitations of the platform might have affected the participants' experiences in MOOC learning. Future research with other MOOC platforms is needed to further explore whether availability and use of various platforms would be more effective and efficient for the learners. Also, the use of other platforms that probably is easier for participants should be explored as this may also be a factor in a participant's withdrawal from the research. Fourth, the major data of this research were collected interviews of the respondents, which was subjective interpretation of experiences with MOOC learner support. To address this issue, a future investigation is needed applying more objective qualitative and quantitative methods, such as quasi-experiments and observations of MOOC learner behaviors. In addition, other methodology

can also be done and still provide a deeper context of the results. Future studies can also examine the motivation and/or reasons for using the MOOC as in some cases, this affects the mode of learner support needed as it reflects the learner demographics and other learner-related characteristics. Fifth, as mentioned earlier, limited time, hence a complete MOOC cycle (4-6 weeks) would also be a good mode of comparison with the current study. Apart from more time, more trials, revisions, if needed, be done for further validation. Sixth, limitation in assessment tools so a use of standardized instrument to measure the effectiveness of the learner support is suggested as an assessment tool.

Recommendations

There are some recommendations from this study. First, MOOC subjects in other areas that can be interesting to other participants can be utilized. Second, adding one or more universities involved in the study can validate or dispute the claims of this current research. In addition, having more institutions involved can hopefully pave the way for more participants and try to avoid the unfortunate problem of having to withdraw from the class due to other commitments. Although, these events really do happen in MOOCs and in some cases, for the same reason. Third, test using another platform or a variety of platforms and if possible, the use of one that learners are familiar with. It would also be interesting to know whether these can be affected by their motivation in completing the MOOC. Fourth, and in response to the limitation raised above, a future investigation to

apply more objective qualitative and quantitative methods, such as quasi-experiments and observations of MOOC learner behaviors. Furthermore, other methodologies and more standardized instruments to provide a deeper context of the results such as examining the motivation in taking the MOOC. Lastly, it is recommended to devote a longer time, whether in being enrolled in the MOOC, preferably a complete MOOC cycle (4-6 weeks) to more testing and trials, for further validation.

Concluding Remarks

Previously established theories of learning help us understand the way we design various means of support for the learners. In the world of MOOCs however, where learners are typically massive, it is quite challenging to have a fixed list of strategies and means of support for the learners. In order to be able to provide them with well-suited means, it is vital to recognize what essential features would be beneficial to MOOC learners. One way is to analyze existing approaches and identify key aspects that match the needs and expectations of MOOC learners. Doing these can potentially pave the way for approaches to provide a better, more meaningful, and effective learner support. Recently and while this research is being completed, the covid-19 pandemic hit the entire world. The result of this study is not just useful in the MOOC context but also in emergency remote learning purposes, which many institutions have adapted. The knowledge of learner support strategies and essential features can also be replicated in such contexts. Although this

current research only examined learner support, the results can hopefully explain and bridge concepts among other learner-related strategies and the like.

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Appendices

Appendix A: Letter to Study One Participants

Good day.

I am currently a PhD Candidate in the Department of Education and Psychology at the International Christian University, Tokyo, Japan, writing my doctoral dissertation entitled "*Integration of Pedagogical, Andragogical, and Heutagogical (PAH) Approaches in Learner Support in MOOCs: An Action Research*".

Through this letter, I am humbly expressing my intent to invite you as one of the key participants in my research.

As a key participant, I intend to conduct a one-on-one Skype or phone interview with you about your learning experience in the N-230 Primary Care of Women class. Specifically, I would like to inquire about your experiences support-wise as a learner in the class.

If you would accept my invitation, I would be very glad to discuss with you the details of the intended research process and its timeline. I intend to have the interview with you from the receipt of this letter until the second week of May. In case this would not work, I am willing to make adjustments on the intended interview based on your availability.

Thank you so much and I am looking forward to your insights as a key participant of my research.

Sincerely yours,

Jennifer Christine Clasara Fajardo
+818013061906
jenniclasarafajardo@gmail.com

Appendix B: Learner Interview Questions (Study Two)

The following questions were asked to the distance learners from UPOU.

a) What are the existing learner support systems in your course?
b) Which of the following fall under pedagogical, andragogical, and heutagogical approaches? (This question was explained by the researcher, yours truly)
c) What is / are the common approaches being used in MOOCs? What were some of the main activities that you did in the MOOC?
d) If you were to rank your overall experience in the entire class, 10 being the highest and 1 being the lowest, what would it be? Explain your answer.
e) What activity did you like the most? Why? What do you like most about this MOOC?
f) What about your dislikes? What activity did you like the least? Why?
g) As a student, how would you describe the support for you as a learner in the entire course? Did you feel it was adequate? Why or why not?
h) What do you think are the aspects of this course that may be improved for future course takers or learners?
i) What made you persist in this MOOC?
j) How comfortable are you in participating in the MOOC? Why?
k) Did you feel a sense of autonomy or freedom of choice in this MOOC? Why?
l) In this MOOC, did you have a sense of connection with the instructor? Why?
m) In this MOOC, did you have a sense of connection with other course-mates? Why
n) In this MOOC, what specific factors and strategies do you consider helpful in comprehending the topics or concepts? Why?

Appendix C: Instructor Interview Questions (Study Two)

The instructor was asked the following questions along with demographic and job background and experience questions.

a) Apart from your designated and described tasks, are there other tasks that you find yourself doing in relation with the class?

b) What is your key / major consideration in selection of which activities and materials will be used? Who prepares and/or gathers these materials? Are there other steps that are being done like pilot testing etc.?

c) What is the form of learner support being provided for the learners of this class? How was it selected? How was it designed? Were there any major considerations?

d) What is/are the common learner support approaches being used in class?

e) As an instructor, which support to learners was most valuable in this class? How was it valuable?

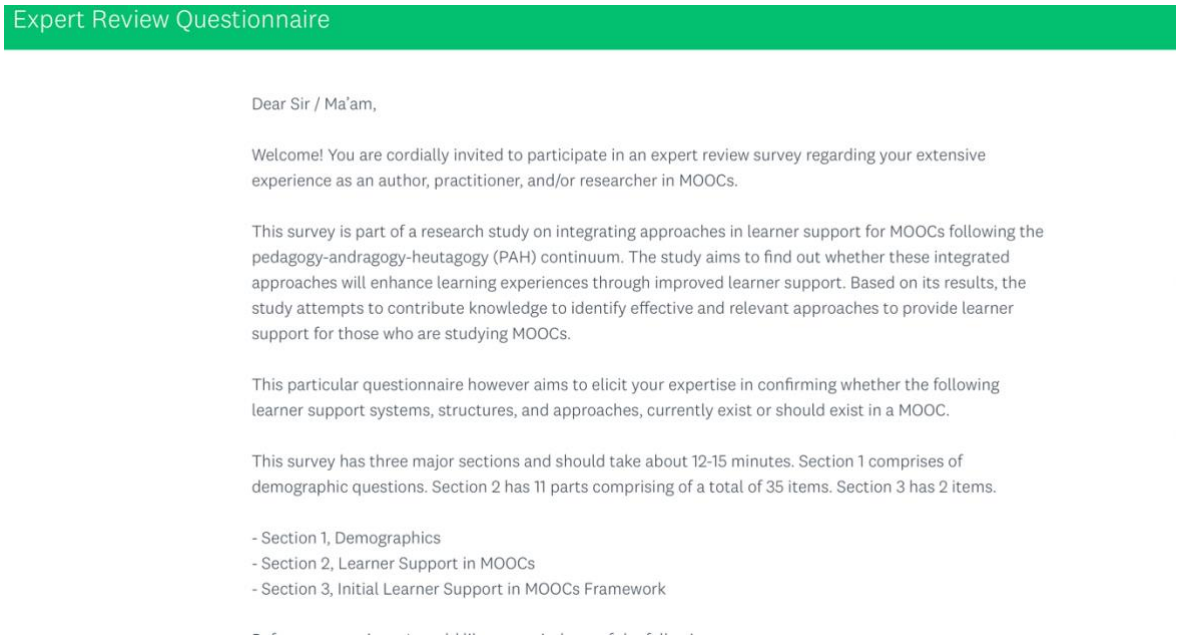
f) What activity did you think the students like the most? Why?

g) What activity did you think the students like the least? Why?

h) How would you describe the support for you as an instructor in the entire course? Did you feel it was adequate and satisfactory? Why or why not?

i) What do you think are the aspects of this course that may be improved for future course takers or learners? What do you think are the aspects of this course that may be improved for instructors like you?

Appendix D: Screenshot of ESRQ (Study Two)



Expert Review Questionnaire

Dear Sir / Ma'am,

Welcome! You are cordially invited to participate in an expert review survey regarding your extensive experience as an author, practitioner, and/or researcher in MOOCs.

This survey is part of a research study on integrating approaches in learner support for MOOCs following the pedagogy-andragogy-heutagogy (PAH) continuum. The study aims to find out whether these integrated approaches will enhance learning experiences through improved learner support. Based on its results, the study attempts to contribute knowledge to identify effective and relevant approaches to provide learner support for those who are studying MOOCs.

This particular questionnaire however aims to elicit your expertise in confirming whether the following learner support systems, structures, and approaches, currently exist or should exist in a MOOC.

This survey has three major sections and should take about 12-15 minutes. Section 1 comprises of demographic questions. Section 2 has 11 parts comprising of a total of 35 items. Section 3 has 2 items.

- Section 1, Demographics
- Section 2, Learner Support in MOOCs
- Section 3, Initial Learner Support in MOOCs Framework

Appendix E: Cover of the Module Notes for Trial MOOC (Study Three

Forest Ecosystem Services & Community Livelihoods

2019

Notebook

APFNe

Appendix F: Snapshot of Module 2 Notes for Trial MOOC (Study Three)

FODE 004
Forest Ecosystem Services and Community Livelihoods

Module II Topic Pages

Module II: Forest Ecosystem Services

Module II Introduction

Humans and their well-being are influenced by the ecosystem around them. The ecosystem provides various services that directly and indirectly benefits them in various ways. Forests are one of the ecosystems whose impact on human well-being transcends the local community and extends to a global scale. There are many types of forests and though they share commonalities in terms of the services that they provide, each type has features that also dictate certain services that are unique to that type. However, this course will focus on tropical forests. In this module, the types of ecosystem services in the context of tropical forests will be presented.

By the end of this module, you should be able to:

- Enumerate the types of forest ecosystem services
- Explain the values of forest ecosystem services
- Illustrate the various interactions of forest ecosystem services and other assets
- Enumerate the benefits of forest ecosystem services to human well-being and livelihood in the context of tropical forests

Appendix G: Features That Make Learner Support Effective

Learner Support	Effective Characteristics
	logical organization (scaffolding of topics)
	short and not boring
	immediate feeback
	repeat play
	professionally developed
Video	interactive
	examples from real life
	use of simple language; easy-to-understand
	useful information
	complements readings
Readings	all essential information; logical, spiral sequenced
	easy reading; easy-to-understand
	helpful embedded questions
	interesting and relevant information
Instruction Support	replies immediately; tries to address concerns
	accommodating; gives encouraging comments
	gives helpful suggestions
Discussion Board	learn and connect from other learners
	venue for communicating ideas
	post questions for clarifications
	give comments and suggestions
	possible collaboration

Appendix H: Sample of Tally of Emails Received (Study Three)

Number of Emails Received and Purposes of the Email

Respondent	# Emails Sent (Week 1-3)	Purpose/s of the Emails
R1	1	acknowledgement of instructor/facilitator's email (1) express interest in the VR tour (1)
R2	6	acknowledgement of instructor/facilitator's email (3) question about the deadline of assignment (1) problem with logging in (2)
R3	2	acknowledgement of instructor/facilitator's email (1) question about the deadline (1)
R4	7	trouble logging in (2) acknowledgement of instructor/facilitator's email (3) question about the deadline of assignment (1) sharing of personal experience related to module (1)