ABSTRACT

Technology is increasingly being utilized in improving quality of education in different disciplines. It has offered many advancements that continuously evolve a traditional four- cornered classroom to a more conducive, flexible, yet interactive one. Networked learning environments enabling student-student and student-lecturer communications are now open, flexible, and more democratic through the use of email, bulletin boards, and chat rooms, while students enjoy the autonomy of gaining success to expertise worldwide through online sources (Hollingworth & McLoughlin, 2001). This education phenomenon has brought up many opportunities for people of different backgrounds and ages to learn a new set of knowledge and skills at their convenience.). In this time of constant change and technology constantly transforms the dimensions of learning, the curriculum design process is expected to be at par with the ever-changing dynamics. Curriculum transformation plays a vital role in the success of learners in the 21st century. It is now gradually transitioning to enabling students to learn more independently from a more autonomous or traditional approach to learning. In summary, to meet the demands of creating independent learners, the metacognitive domain should be considered in the curriculum design process.

Keywords: Educational technology, Curriculum, Instruction

I. INTRODUCTION

Technology is increasingly being utilized in improving quality of education in different disciplines. It has offered many advancements that continuously evolve a traditional four-cornered classroom to a more conducive, flexible, yet interactive one. Networked learning environments enabling student-student and student-lecturer communications are now open, flexible, and more democratic through the use of email, bulletin boards, and chat rooms, while students enjoy the autonomy of gaining success to expertise worldwide through online sources (Hollingworth & McLoughlin, 2001). This education phenomenon has brought up many opportunities for people of different backgrounds and ages to learn a new set of knowledge and skills at their convenience. Various programs and courses are now conducted online, supplemented by other education infrastructures like learning management systems (LMS). LMS is a software application or webbased technology used to plan, implement and assess a specific learning process (Alias & Zainuddin, 2005). It provides functions for the instructor to design delivery content, class

participation, and assessments. Moreover, students are given opportunities to explore functions like discussion boards, chats and emails, and many more to support their learning.

In theory, the growth in learning management systems has provided rich learning environments built in social cognitive approaches to support student learning, off and on campus (Weaver, Spratt & Nair, 2008). Learning can now be considered self-paced and self-motivating. In fact, several studies corroborate the claim in which face-to-face education is as good as online distance learning (ODL) in terms of quality of learning (Hong, 2002; Kleinman & Entin, 2002; Rovai, 2002; Jang, Krug & Zhang, 2007). Given all the benefits of this 'New Normal' education as coined by Hinssen (2010). Hinssen has emphasized that traditional and online learning environments will be indistinguishable in the future. On the other hand, there are still gaps of knowledge that should be addressed and narrowed concerning ODL. Moreover, instructors and students have different concerns (see Figure 1) with the use of online platforms for learning (Mills, Yanes & Casebeer, 2009; Vayre & Vonthron, 2018).

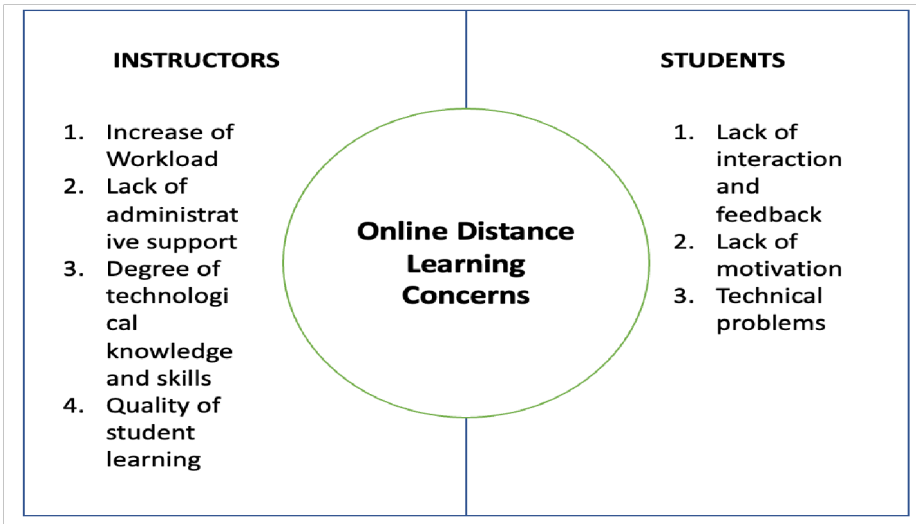

Figure 1. *ODL concerns of instructors and students*

The figure above discusses the concerns of the main stakeholders of the teaching and learning process – instructors and students. Mainly, the fourth concern of instructors could serve

as the umbrella for the student concerns. This is because quality of student learning is a huge concept that several educational researchers are defining in different contexts (i.e., constructivist, behaviorist, cognitivist, etc.). Conversely, what is essential to understand, regardless of context, students' needs should be met to attain the end goal of a curriculum – for students to learn new set of knowledge and skills. In online learning environments, lack of interaction and motivation among students are evident. In a study conducted by Summers and Waigandt (2005), they emphasized that lace of interaction can leave students feeling isolated from each other and from their instructor. Thus, resulting to more pressing issues in student learning such as lack of motivation to learn in ODL. Ultimately these concerns of student isolation, disconnection, loneliness, lack of personal attention and support, result to student failure and tendency to dropout from the course (Vayre & Vonthron, 2018).

In line with the student concerns regarding lack of interaction and motivation, the curriculum should be designed in accordance to the 'New Normal' delivery of learning. ODL should be gearing towards fostering metacognitive skills such as self-regulation and self-efficacy. In summary, this paper discussed the importance of fostering metacognition to the curriculum design process in ODL and its perceived implications to student achievement.

Theoretical Definition of Terms:

1. Metacognition – is a term used to describe skills involved in monitoring learning and making changes in either how or what one studies (Garrett, Alman, Gardner & Born, 2007).
2. Online Distance Learning (ODL) – is an educational process where students receive instructions through online classes, video recording and conferencing, or any other audiovisual technology medium (Loveless, 2021).

3. Student Achievement – is impacted on numerous levels including students' personal factors, their interactions with others such as parents, teachers, and administrators, and lastly the larger systems that surround the student e.g. school districts, neighborhoods, local economy, political policy, and multicultural relations (Bertolini, Stremmel & Thorngren, 2012).

II. The Curriculum Design Process in Online Distance Learning

Curriculum is regarded as the heart of the education institution. It defines the role and responsibility played by stakeholders in making the teaching and learning process possible and fruitful. Curriculum is planned and formulated to come up with an effective, yet flexible curriculum design. Curriculum design is the process of planning effective learning experiences (Dodd, 2020). Given the plethora of learning delivery modalities in the 21st century - face-to-face or traditional set-up, blended learning and pure online and distance learning, how do we define an exact effective curriculum design?

Online Distance Learning (ODL) is now considered a learning delivery modality that makes learning experiences more unique as the potential of online resources is being harnessed. For developed countries, there still are minorities that could not cope with the demands of ODL. Some of which are lack of access to internet, lack of gadgets used by students and many more. For developing countries like the Philippines, due to the pandemic, flexible learning modalities are abruptly introduced to the Filipino learners and stakeholders. Thus, resulting to different pacing of transitions for everyone that comprises the learning community. One of the most observed

modality in the Philippines recently is ODL. This has brought up several concerns from different stakeholders. One of the most pressing concerns is the lack of gadgets for student learning. Although Porter (2005) have stated that not all online classes have to use the latest gadgets or multimedia designs to effective, it is imperative to note that this concern has significantly impacted the way Filipino students learn amidst the pandemic.

There are several considerations in designing a curriculum. Questions such as, in what context should the designing process focus? What are the approaches in efficiently designing one?

Are just some of it. On one hand, determining how much technology is needed to meet the needs of learners and the demands of a specific course is also an important part of developing successful 21st century learning programs (Phipps & Merisotis, 1999; Porter, 2005). Hence, in what direction should the whole complex process of curriculum designing start?

In her book, titled 'Developing an online curriculum: Technologies and Techniques', Lynette Porter have heavily emphasized that all levels of administration must work harmoniously and share coherent and cohesive vision for planning the direction that online activities will take. Understanding the online class set-up is essential to formulate effective activities that promote meaningful online learning experiences for students. Teachers, play a crucial role in the whole ODL process. They understand the needs of the target audience (students) and the activities and assignments that will work most effectively for them. This makes the whole online program/course a system and a technology with which users (i.e., teachers and students) must learn to work (Blythe, 2001 as cited in Porter, 24). This importance given to the users of technology and the designers of it are considered vital approaches in designing curriculum in ODL.

The first approach in ODL curriculum design is **user-centered approach**. This design involves the users of the educational infrastructure, primarily, the teachers and students. This approach

requires a great deal of planning to ensure that the design works with a variety of users. The users may come from different backgrounds like age groups, ethnicity, culture-bound and many more. Students are actively involved in this approach to speak for what activities would make every lesson a fruitful, yet productive ODL experience. Thus, the purpose of having usercentered approach in curriculum design entails binding all users in a similar (but not exact) curriculum that could be flexible somehow. Flexibilities may be offered in varying circumstances, based on the user's background. More importantly, having a well-structured and user-centered approach in a curriculum would make learning universal and more applicable to a wider scope.

The second approach in designing course/program in ODL is the **designer-centered approach**. Teachers should be actively involved in this perspective. Whoever is the course designer determines how the course site will operate and what will be included in the electronic materials (Blythe, 2001 as cited in Porter, 2005). This approach includes the close involvement of experts of the course/program, such as experienced teachers, curriculum developers and teachers. This collaboration would give much more emphasis on what the lessons should be and how they will formulate learning activities that foster effective learning, based on existing studies and researches and instructional materials.

It is always good to know that there are existing approaches in designing curriculum for ODL. Clearly, no one is superior form the other, in terms of how effective these approaches would be in the creating meaningful learning experiences. Many educationalists believe that there has to be a balance between learner-centered and designer-centered approaches. This gives certain limitation to the autonomy of a specific stakeholder. The mentioned approaches give heavy emphasis on the primordial involvement of stakeholders in curriculum designing. Much more of this, there is a dimension in curriculum designing for ODL that is often neglected – the pedagogical concerns. In

a study conducted by Summers and Waigandt (2005) in undergraduate statistics students, it could be noted that many of the significant differences in online and face-to-face statistics class stemmed from pedagogical issues more than logistics problems. It only makes it imperative to give importance on addressing pedagogical concerns in the whole curriculum design process.

Educationalists believe that there are different pedagogical approaches in curriculum design process. They have varying point of views on how learning experiences for students mean.

Although the process may be different, these pedagogical approaches believed by educationalist point out to one common goal – fostering meaning learning experiences. There are two well-known pedagogical approaches in curriculum design process: **constructivism** and **behaviorism**. The constructivist approach relies on the principle that real-world experiences and social contexts in which knowledge and skills are typically used and emphasized (Porter, 2005). Corroborating this definition, McDonald and Reushle (2002) as cited in Porter (2005) have mentioned that interactions help students construct knowledge. Given these points, constructivist approach to curriculum design focuses on building learning experiences in the context of real-word environment. For example, in the context of ODL, online learning activities may mimic tasks related in the actual workplace. These are learning activities that stimulate students' understanding of the actual workplace. These types of activities or learning assessments are called authentic assessments (Mueller, 2018). Some other types of learning activities that could be incorporated in ODL under constructivist approach are: problem-solving, simulations and team building.

The behaviorist approach on the other hand is a different one. It is based on the concept that students should be provided materials in which they will gather important concepts (Porter, 2005). Additionally, this approach is often pictured as teaching imparting information through lectures or notes and is generally more passive for learners. In the ODL set-up, behaviorist curriculum

designers often give students links to websites and other materials as a framework of knowledge necessary to understand a subject (Makkonen, 2002 as cited in Porter, 2005). For example, in teaching biology, students are given links to different e-books about the skeletal system. In this way, students will be given the opportunity to learn the basic concepts before they delve on to a more challenging part of the lesson about skeletal system.

The approaches to ODL curriculum design should be the foundation of the process itself. One should understand his point of view on how curriculum should be treated and implemented. The user-centered, designer-centered, constructivist and behaviorist approaches are just some of the things stakeholders should take into consideration as we delve on the potentials of technological advancements in curriculum development. To narrow the gap between ODL and curriculum design, all stakeholders should be mindful of the curriculum outcomes as reiterated by Ramanau (2016):

> *Despite the potentially global reach through online delivery, the web-based learning environment also poses challenges of its own, due to different preferences for media use across groups of students studying in different contexts and the need for contextualization at the level of media use.*

III. Fostering Metacognitive Skills in Online Distance Learning Curriculum Design

Interaction and socialization are keys to effective online education (Porter, 2005). As a matter of fact, internationalization is not a new concept to educational institutions as most of them are gearing towards global competitiveness of their graduates. This implies that continuously transforming the way education policies and standards is the new normal to these institutions. Creating policy (at every level of schools from building to federal levels) is necessary to improve learning outcomes catered to learners and to shape graduate expectations (Bertolini, Stremmel,

Thorngren, 2012). Nonetheless, tt was already furthered that formulating effective curriculum in ODL is quite a challenge, educational institutions are still trying to surpass.

Another thing to note is that, in ODL, it is difficult to come up with a common ground since learners could come from different contexts and backgrounds and student achievement is a concern that needs to be addressed. Student achievement is impacted on numerous levels including students' personal factors, their interactions with others such as parents, teachers, and administrators, and lastly the larger systems that surround the student e.g. school districts, neighborhoods, local economy, political policy, and multicultural relations (Bertolini, Stremmel & Thorngren, 2012).Thus, understanding the systems and backgrounds of students is imperative to attain academic achievement. Doing so, it is vital for stakeholders concerning the curriculum design process to consider the different systems affecting student achievement – most especiall in ODL environment.

The Bronfenbrenner's Bio-ecological Model (1979) contains four levels from the most personal to the externalized elements of a person's life experiences. This model can also be applied to the context of student's academic experiences, as those four levels (see Figure 2) also discuss the aspects of personal life affecting their academic-related experiences. Studies in the past focus on the efficacy of instruction and its correlation to student achievement. These empirical sources information provided avenues to better understand how students learn holistically. A paradigm shift from traditional authoritative class instruction to learner-centered instruction is also a result of these educational researches. Learner centered instruction is designed to include four general areas: cognitive and metacognitive, motivational and affective, developmental and social and individual differences (Cornelius-White, Harbaugh, 2010 as cite din Bertolini, Stremmel & Thorngren, 2012). The areas mentioned are key players in student achievement. Nevertheless, the

less explored area is the metacognitive domain of student achievement. This idea coincides with Bronfenbrenner's Bio-ecological Model as it is one of the basic foundations (Microsystem) of understanding student's academic-related experiences. Due to the pandemic, flexible learning is now the new normal in terms of education system. Learning delivery modalities. Given the situation, this paper's primordial focus is to bring about the concept of fostering metacognitive skills in curriculum design process in ODL. In relation to the Bio-ecological model, the microsystem factors (e.g., student resiliency, developmental differences, etc.) are comprised of traits within the student as well as their direct interactions with others such as teachers and other students. Interaction which is mostly an issue in ODL (Summers & Waigandt, 2005; Dell 2009; Vayre & Vonthron, 2018).

One of the factors that significantly impacts student learning and engagement in school (based on Bio-ecological model microsystem) is individual student abilities. These abilities include cognitive and metacognitive factors affecting student's ability to learn, and more importantly to critically understand how to best understand and process information. As cited in Bertolini, Stremmel and Thorngren (2012), these cognitive and metacognitive skills promote the following:

a. critical thinking opportunities (Marzano, Pickering, & Pollock, 2001);
b. connection of learning to student context (past, present and future); and
c. selection of options for how learning can occur with some autonomy (Tomlimson, 2001)

To expound on the premises of cognitive and metacognitive skills and their perceived influence to student achievement in ODL, incorporating such skills in the curriculum is necessary. Dell (2010) have heavily emphasized the need for metacognitive skills in ODL such as self-reflection, self-regulation and self-monitoring. These skills would smoothen the transition of students from learning dependency to self-motivated ones. Thus, these skills would lead to more positive online

learning outcomes. To be able to come up with a metacognition-abled curriculum in ODL, understanding the variables of student achievement is necessary. In ODL, the usual concerns revolve around pedagogical variabilities of instruction. The following are common pedagogical concerns that may affect student achievement (Dell , 2010):

a. the use of problem-based learning strategies;
b. student and instructor mediated communication;
c. course and content information provided to students; and
d. use of video provided by the instructor.

To address the pedagogical variabilities, it was also mentioned in the same study that instructors of online classes should focus their effort on quality course design rather than the characteristics of media. Hence, all concerns in ODL stemmed up from course design – which involves instruction and assessment designs. To further resolve the issues, Norton and Hathaway (2008) indicated that promotion of time management, workload pacing, and appropriate learning strategies are keys to attaining self-regulation and self-efficacy – which are metacognitive skills in nature. For example, in a study conducted by Onuka (2012), it was stated that time management skills are highly correlated to student achievement. Specifically, lack of time management skills had hindered effective learning as students could not manage task time effectively. It as much was less effective in the learning styles and the concomitant learning/ study effectiveness.

To attain the goal of fostering metacognition in the curriculum design process, developers and designers should focus on the core of the curriculum – intended outcomes. See to it that there is a balance between and among learning domains – cognitive, affective, and behavioral. It is imperative to note that students should attend to their learning more independently in online distance learning environments than in face-to-face classes. **Hence, developing specific and attainable metacognitive domains, applying them to intended learning outcomes and**

ultimately in the instruction and assessment design would make a significant impact in student achievement in ODL.

IV. Conclusion

The success of ODL requires systemic planning, creating a draft, assessing and putting the system into practice, and education is actively supported and stimulated (Balogh, Munk & Turcani, 2011). In this time of constant change and technology constantly transforms the dimensions of learning, the curriculum design process is expected to be at par with the ever-changing dynamics. Curriculum transformation plays a vital role in the success of learners in the 21st century. It is now gradually transitioning to enabling students to learn more independently from a more autonomous or traditional approach to learning. In summary, to meet the demands of creating independent learners, the metacognitive domain should be considered in the curriculum design process. This proposition is yet to be explored and subjected to further studies.

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