Modular Distance Learning in the Area of Education During the New Normal: A Systematic Review

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ABSTRACT

In the Philippines, attempting to push through education despite the fatal pandemic caused by Covid-19 has proven difficult. Despite several objections, the Department of Education (DepEd) and the Commission on Higher Education (CHED) accepted and implemented the flexible blended learning model, despite the risk of open courses due to the virus. Modular (Printed), Modular (Digital), Online, Educational TV, Radio-Based Instruction, Home Schooling, and Blended Learning are the many learning modes. Using the systematic review, the study aims to determine the main educational experiences that used the Modular Distance Learning approach to promote educational knowledge within the Higher Education stage. Modular Distance Learning is implemented for those living in rural areas or provinces where internet connection is only available for a few. The usage of Modules created by teachers with various tasks and learning activities based on fundamental learning abilities is known as modular distance learning. Thus, the main findings of the study revealed that the implementation of modular distance learning or distance education resulted in a significant improvement in students’ knowledge of the specific content covered, despite the fact that both technical and non-technical problems occur during their teaching in distance learning.
KEYWORDS

Education, modular distance learning, new normal education, COVID-19, systematic review, Philippines

INTRODUCTION

Education has a significant impact on the lives of learners. Teachers are an important part of this process since they are one of the most important tools for delivering high-quality education. The introduction of COVID-19 in the Philippines resulted in significant changes in the educational environment. One of these is the Department of Education’s implementation of a new form of education. Most education systems have been forced to create alternatives to face-to-face teaching and learning as a result of the present COVID-19 dilemma. Many educational institutions have relocated activities online in order to continue teaching despite classroom closures (Ambayon, 2020).

The transition in school teaching-learning delivery to modular distant learning makes the delivery of fundamental quality education more difficult for school workers (Arcilla et al., 2022; Isnani, 2019). That is why DepEd officials are always looking for solutions to alleviate challenges and equip teachers and school administrators to be more effective in the field of modular remote learning (Bagood, 2020).

In the Philippines, modular distance learning is the most widely used learning delivery method, in which students study classes via self-learning modules. Students are provided self-learning modules once a quarter to continue their self-paced study at home. Individualized teaching in which the learner employs self-learning modules and other learning resources with little contact from the teachers is referred to as this modality (Dangle & Sumaoang, 2020, DepEd Order No. 012, s. 2020). The teacher’s role in this modality, however, is to keep track of the student’s progress. The student may request assistance from the teacher by email, text message, instant chat, phone call, or even a home visit (Lapada, Miguel, Robledo, & Alam, 2020). Moreover, any family member or stakeholder in the community may be served as a para-teacher to assist the learning needs. In modular distance learning, students are autonomous and agents to take charge of their learning individually (Malipot, 2020). Because the exercises on the modules are self-paced, they build a sense of responsibility. Teachers must, however, assess students’ learning requirements, offer necessary interventions, and use accessible local resources, such as internet materials (Martineau, Charland, Arvisais, & Vinuesa, 2020).

The new normal education, along with its many modalities, was first met with opposition due to the risk, but thanks to the efforts of education sectors in the Philippines, it is now being implemented systematically with the objective of continuing education despite the pandemic (OECD, 2020). Even in this sort of academic setting, where students learn at home with the assistance and supervision of their parents in their
SLMs (self-learning modules), there are more students who are learning. These learners are open-minded learners and flexible with changes in their environment (Labrado, Labrador, Rosal, Layasan, & Salazar, 2020), (DepEd Order No. 012, s. 2020).

The designated teaching staff, in collaboration with the Education Program Supervisors, developed modules in all topics for all grade/year levels throughout four quarters beginning in May 2020, in accordance with the “Most Essential Learning Competencies.” (Sherry, 1995). These self-learning modules are already learning packages, including a pre-test, discussion, and a set of evaluation/assessment questions. With the modular learning class schedule, they are given to all learners. Teachers in public schools all around the Philippines have adopted this type of educational strategy. Teachers are critical to maintaining high-quality education in the face of the epidemic (Konopka, Adaime, Mosele, 2015).

Teachers were acutely aware of the COVID-19 pandemic’s existence and repercussions. Despite the hazards posed by the COVID-19 pandemic, teachers continue to assist students by developing modules that act as a learning guide (Aguilera-Ruiz, Manzano-León, Martínez-Moreno, Lozano-Segura, Yanicelli, 2017). As a result, the teacher becomes a facilitator in the growth of the student as a member of their community and society (Abellán-Toledo, Herrada-Valverde, 2016; Colomo-Magaña, Soto-Varela, Ruiz-Palmero, Gómez-García, 2020). However, teachers also air their problems on modular distance learning (Albitrini, 2006). As front-line educators in the educational system, they have undergone various training and seminars to better equip them to deliver better education in the face of the COVID-19 pandemic, as it is standard practice for the department to train teachers not only for professional growth but also to be prepared for unexpected circumstances (Allagui, 2014; Al-Maroon, Al-Emran, 2018).

When compared to traditional teaching methods, modular education is more effective in the teaching-learning technique because students study at their own pace (Meredith, 2019). It is an unlimited self-learning process in which students are stimulated and their interest is piqued by quick reinforcement, such as a remark on a practice exercise. As a result, this type of learning modality promotes a student-centered learning strategy. However, instructors, students, and parents faced several obstacles as a result of the deployment of modular learning (Alwehaibi, 2015; Aminullah, Loeneto, & Vianty, 2019). Lack of school funds in the design and distribution of modules, kids’ struggles with self-study, and parents’ lack of understanding to academically advise their child/children were the primary issues that arose. As a result, it is clear that there are challenges involved with using modular distance learning (Isnani, 2019).

Due to the country’s current covid-19 crisis, parents have become more aware of their role in their children’s learning and education. They now understand that teaching is a difficult task. There are parents who have adapted to the current circumstances and do not criticize teachers if they are their children’s teachers at home these days (Azhar
and Iqbal, 2018).

In this time of epidemic, students are learning not just particular topics, but also morals. They learn time management since, even if they are at home, they must adhere to their timetable when completing the LAS or learner’s answer sheets based on their SLM or self-learning modules. They also form stronger bonds with their parents and guardians while studying and teaching at home (Beri and Sharma, 2019).

Some teachers see the epidemic as an opportunity for educational advancement by creating self-learning modules (SLMs), which compile all of the essential lessons, objectives, and competences into a single module for different courses every quarter (Bidarian, Bidarian, and Davoudi, 2011).

The efficiency of distant education systems is influenced by a variety of elements that influence their success or failure (Meredith, 2019). These include the impact of distance learning theory on instructional design and delivery, redefining the roles of partners in distance education teams, media selection, technology adoption, change implementation, methods and strategies to increase interactivity, inquiry, and active learning, learner characteristics and modes of learning, teacher mediation and learner support, operational issues, policy and management issues, and cost/benefit tradeoffs, as well as operational issues, policy and management issues, and cost/benefit tradeoffs. It’s meant to be read with Sherry and Morse’s (1994) training needs assessment (Sherry, 1995; Blake, 2016).

**OBJECTIVES OF THE STUDY**

Based on these ideas, the main objective of this work was to locate the main educational experiences that would use the Modular Distance Learning approach for the promotion of educational knowledge within the Higher Education stage. With this purpose in mind, the study aimed to: (1) determine the main experiences in which the Modular Distance Learning Approach is being implemented to achieve an acquisition of knowledge; (2) identify the journals which published scientific articles on this field; (3) determine the reason of using the modular distance learning approach on students; and (4) identify the instruments used in measuring the effectiveness of the modular distance learning.

**METHODOLOGY**

Based on the ideas set out above, this work is part of the systematic literature review method, conceived as that which analyses information provided to generate an overview of a certain object of study, specifically information provided in databases or scientific reports (Candarli, Yuksel, 2012; Cresswell, 2014). This type of research allows the categorization of the results to date on the topic, as well as measuring the data based on different criteria regarding the relevant issues that need to be clarified (Chun, 2016;
Cresswell, 2014).

For this purpose, the methodological process consists of a sequence of steps that go from the defining of the scope to the classification of the data obtained. For this purpose, the work phases proposed in the PRISMA declaration (Preferred Reporting Items for Systematic reviews and Meta-Analyses) were followed (Cresswell, 2014).

The examination process carried out was divided into two steps:

- Planning: This protocol included the establishment of descriptors and databases from which the scientific articles would be obtained, as well as the defining of the research questions, inclusion and exclusion criteria, and the formulation of the research questions.
- Action: We went on to locate references in the chosen databases, refine the data using various filters to extract information, and finally create a visual representation of the data. The inclusion and exclusion criteria were created in accordance with the study’s aims and the PRISMA declaration’s guidelines (Cresswell, 2014; Ekmekci, 2015).

Search Strategy

The search of the scientific papers was carried out in the international databases Web of Science (WoS) and Clarivate Analytics. These two databases were chosen for their potential and international reputation, as well as for the criteria they use to index their articles (Faramarzi, Elekaei, and Koosha, 2015). In the case of the Web of Sciences, the search was carried out in the Social Sciences Citation Index (SSCI), Science Citation Index Expanded (SCIE) and Arts and Humanities Citation Index (AHCI). The search equation was used, which is composed of the following descriptors: “Modular Distance Learning” or “Distance Learning”, and “Distance Education”.

The descriptors were applied in the searching engine of both databases in order to filter them further. In order to do so, a list of inclusion and exclusion criteria was set up to limit the study sample (Table 1).

To avoid any bias in the selection of the studies, after other works of systematic review (Fay, Matias, 2019) the researcher conducted the systematic review using the identical descriptors and criteria for inclusion and exclusion.
Table 1. Inclusion and Exclusion Criteria

<table>
<thead>
<tr>
<th>Inclusion Criteria (IC)</th>
<th>Exclusion Criteria (EC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Published in Web of Science indexed with Science Citation Expanded (SCIE), Social Sciences Citation Index (SSCI), and Arts and Humanities Citation Index (AHCI)</td>
<td>1. Not published in Web of Science indexed with Science Citation Expanded (SCIE), Social Sciences Citation Index (SSCI), and Arts and Humanities Citation Index (AHCI)</td>
</tr>
<tr>
<td>2. Articles published in Clarivate Analytics</td>
<td>2. Articles are published in SCOPUS and others</td>
</tr>
<tr>
<td>3. Articles written in English</td>
<td>3. Articles that are not written in English</td>
</tr>
<tr>
<td>4. Articles available in Open Access</td>
<td>4. Articles not available in Open Access</td>
</tr>
<tr>
<td>5. Educational experience in which I used the Modular Distance Learning Approach in the field of Education</td>
<td>5. Educational experience in which I used the Modular Distance Learning Approach in another field of discipline</td>
</tr>
</tbody>
</table>

Procedure

First, using the Prism Declaration (Cresswell, 2014; Ekmekci, 2015) as a reference, the procedure was divided into four specific phases. The first, called “Identification”, consisted of applying the database search equation, filtering the search for scientific articles (IC1, EX1) in English (IC3, EX3), obtaining a total of 7 documents (WoS; Clarivate Analytics). After that, in the review phase, most of the inclusion criteria (IC2, IC4, IC5) and exclusion criteria (EX2, EX4, EX5) were applied. In order to shorten this procedure, a flow chart is presented that shows the process described from the initial location of documents to the final scrutiny of the sample of articles that make up the systematic review study (Figure 1).
RESULTS AND DISCUSSION

First, the studies were grouped according to the year in which they published (Figure 2). In this case it can be seen that the year 2020 was the one with most contributions, followed by 2021 and 2019, respectively.
On the other hand, looking at the journals in which these scientific papers have been published (Table 2), it can be seen that the articles have been published in different platforms. According to the origin of the journals, they correspond to different countries, among which the United States of America stands out with four (4) publications.

Table 2. Journal Origin According to Country

<table>
<thead>
<tr>
<th>Reference</th>
<th>Journal</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Poellhuber, Roy, &amp; Bouchoucha, 2019)</td>
<td>1. International Review Of Research In Open And Distributed Learning</td>
<td>Canada</td>
</tr>
<tr>
<td>(Fairlie, &amp; Loyalka, 2020)</td>
<td>2. NPJ Science Of Learning</td>
<td>Germany</td>
</tr>
<tr>
<td>(Williyan, 2020)</td>
<td>3. Language Learning &amp; Technology</td>
<td>USA</td>
</tr>
<tr>
<td>(Cellini, &amp; Grueso, 2021)</td>
<td>4. AERA Open</td>
<td>USA</td>
</tr>
<tr>
<td>(Nieuwoudt, 2020)</td>
<td>5. Australasian Journal Of Educational Technology</td>
<td>Australia</td>
</tr>
<tr>
<td>(Fidalgo, Thormann, Kulyk, &amp; Lencastre, 2020)</td>
<td>6. International Journal Of Educational Technology In Higher Education</td>
<td>USA</td>
</tr>
<tr>
<td>(Marzoli, Colantonio, Fazio, Giliberti, di Uccio, &amp; Testa, 2021)</td>
<td>1. Physical Review Physics Education Research</td>
<td>USA</td>
</tr>
</tbody>
</table>
According to the education contents that have been addressed during the Modular Distance Learning experiences, it mainly corresponds to the treatment of the derivative and the limit of functions (Table 3). However, there are also works

Table 3. Education Content covered in each educational experience.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Education Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Poellhuber, Roy, &amp; Bouchoucha, 2019)</td>
<td>Understanding Participants' Behavior in Massively Open Online Courses</td>
</tr>
<tr>
<td>(Fairlie, &amp; Loyalka, 2020)</td>
<td>Schooling and Covid-19: lessons from recent research on EdTech</td>
</tr>
<tr>
<td>(Williyan, 2020)</td>
<td>ICT in Distance Learning: Teacher's Attitudes and Problems</td>
</tr>
<tr>
<td>(Cellini, &amp; Grueso, 2021)</td>
<td>Student Learning in Online College Programs</td>
</tr>
<tr>
<td>(Nieuwoudt, 2020)</td>
<td>Investigating Synchronous and asynchronous class attendance as predictors of academic success in online education.</td>
</tr>
<tr>
<td>(Fidalgo, Thornmann, Kulyk, &amp; Lencastre, 2020)</td>
<td>Students' perceptions on distance education: A multinational study</td>
</tr>
<tr>
<td>(Marzoli, Colantonio, Fazio, Giliberti, di Uccio, &amp; Testa, 2021)</td>
<td>Effects of emergency remote instruction during the COVID-19 pandemic on university physics students in Italy</td>
</tr>
</tbody>
</table>

Finally, each investigation’s goals were examined in depth, as well as the technique employed and the reason of using modular distance learning on students once the approach was implemented (Table 4). In general, all studies assert that using Modular Distance Learning has improved instructors’ and students’ attitudes toward Distance Learning, and in some cases, the entire discipline. Parallel components of learning, such as self-learning (independent learning), autonomous learning (individual learning), and greater academic achievement, also benefit. On the other hand, methodological quantitative studies, as well as experimental, quasi-experimental designs of a comparative character across academic years.

Table 4. Education Content covered in each educational experience.

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Objective</th>
<th>Method</th>
<th>Instrument</th>
<th>Reasons in using MDL in the New Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Poellhuber, Roy, &amp; Bouchoucha, 2019)</td>
<td>To systematically divide the large number of learners into categories or patterns that would make sense from a behavioral engagement perspective.</td>
<td>quantitative study relied on big data and learning analytics methodology, qualitative, mixed method using the exploratory analysis</td>
<td>Resources (document, video, etc.), events (discussion, communication, etc.), and visits (logging in the course webpage).</td>
<td>If to consider the engagement capacity of children, modular distance is more convenient.</td>
</tr>
<tr>
<td>(Fairlie, &amp; Loyalka, 2020)</td>
<td>To evaluate the effectiveness of EdTech as a substitute for traditional schooling</td>
<td>Experimental computer-assisted learning program</td>
<td>It is much accessible for the kind of pupils in the community.</td>
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<td>-----------------------------------------------------------------</td>
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</tr>
<tr>
<td>(Williyan, 2020)</td>
<td>To investigate the attitude of the teachers towards the use of ICT in distance learning as well as the problems faced by them</td>
<td>Mixed method (mixed of quantitative and qualitative method) Questionnaire, and semi-structured interview questions</td>
<td>It is more reliable and convenient to pupils who do not have gadgets</td>
<td></td>
</tr>
<tr>
<td>(Cellini, &amp; Grueso, 2021)</td>
<td>To compare the performance on the exit exam for students in online and on-campus programs both across and within institutions, degrees, and majors</td>
<td>Quasi-experimental computer-assisted learning program</td>
<td>Not every pupil is fortunate like their classmates and most of them only rely on books, that is why modular is more applicable than online learning</td>
<td></td>
</tr>
<tr>
<td>(Nieuwoudt, 2020)</td>
<td>To investigate the relationship between students’ academic success and online interaction and participation and explored their class attendance (synchronous virtual classes and/or watching the recorded virtual classes) in the online study mode of an enabling program</td>
<td>Quantitative research Online Survey</td>
<td>Academic success may be increased by providing various options for students to participate and interact online, and to attend classes synchronously or asynchronously. The flexibility of online education can enable students to be successful in their studies. The inclusion of varied activities is therefore recommended to increase academic success in online education.</td>
<td></td>
</tr>
<tr>
<td>(Fidalgo, Thormann, Kulyk, &amp; Lencastre, 2020)</td>
<td>To examine what undergraduate students’ perceptions are concerning DE and their willingness to enroll in this type of course.</td>
<td>Quantitative research Online Survey</td>
<td>More time to read/study the lesson. It is more reliable and convenient to pupils who do not have gadgets.</td>
<td></td>
</tr>
</tbody>
</table>
To assess the experience of emergency remote instruction due to the COVID-19 outbreak. To assess the psychological well-being, motivation for physics, academic orientation, attitude towards physics and physicists, and tried to link these factors to their overall perception of the online instruction.

Mixed method (qualitative and quantitative) Online survey

MDL provides greater flexibility for students to work at their own pace and review work as needed.

CONCLUSIONS

In recent years, one of the most practical and significant methodological breakthroughs has been the introduction of modular distance learning or online education/distance education, particularly in times of epidemic. The debut of this teaching approach in the sphere of education, in particular, has led to a number of Higher Education instructors incorporating it into their everyday job outside of the classroom (Nieuwoudt, Fidalgo, Thormann, Kulyk, & Lencastre, 2020). The goal of this study was to look at the most common encounters with this approach and evaluate how it affected learners. Thus, the main findings of the study revealed that the implementation of modular distance learning or distance education resulted in a significant improvement in students’ knowledge of the specific content covered, as teachers’ attitudes toward using ICT in distance learning are positive, despite the fact that both technical and non-technical problems occur during their teaching in distance learning when using ICT and the flexibility of online e-learning.

As a result, this results supports prior research that has determined the efficiency of Modular Distance Learning or Distance Education in this context (Nieuwoudt, 2020; Gon, and Rawekar, 2017). Similarly, the combined (quantitative and qualitative) nature of the technique resulted in an increase in student motivation as well as a more favorable attitude toward the material and education in general (Fidalgo, Thormann, Kulyk, & Lencastre, 2020). Moreover, the improved motivation rates following the deployment of active techniques that include technology into their instructional processes, as evidenced by the scientific literature (Faramarzi, Elekaei, and Koosha, 2015; Fitzgibbon, 2003). Similarly, improvements in areas such as distant learning outside of the classroom, as well as self-directed learning, should be emphasized. Placement of part of the methodology’s activity outside the classroom, on the other hand, encourages the development of self-learning and autonomous abilities in learning. This assumption, however, cannot be fully verified, because the findings of this review revealed that, while the majority of
students achieved this goal, a small group did not follow the modules and had a harder time integrating themselves into the new normal education (Harmer, 2007; Jafari, and Chalak, 2016). In brief, the use of Modular Distance Learning or Distance Education is becoming an increasingly popular practice in the educational scene especially during this time of COVI-19 pandemic.

With the introduction of technology into the classroom, the paradigm of teaching has shifted in favor of modular and online education. One of the study’s shortcomings was that it was not able to examine papers that were not open access, which reduced the number of studies in the sample to a minimal number. As a result, a portion of the scientific literature cannot be evaluated or comprehended. Future research lines, on the other hand, will continue to promote the use of the modular distance learning approach within the education branch as one of the key lines of educational innovation. In this view, the provision of excellent practices will enable instructors of all educational levels in the field of education with ideas to use modular distance learning or the distance learning in this current scenario.

In conclusion, society’s rapid technological growth and limitation to internet connectivity, and hence the educational systems, has resulted in a significant shift in the teaching–learning process. Teachers must study their students’ interests and motivations in order to organize their instruction when faced with a student body that is vastly different from that of a few years ago. As a result, incorporating technology into modular teaching techniques is considered as a solution that engages students, enhances interest in the subject and the information covered, and, as this study has demonstrated, improves greater knowledge acquisition and academic freedom, particularly during pandemics.

LITERATURE CITED


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