ISSN: 2278-4012, Volume:12 Issue:3, September 2023

Tool to Evaluate Developed Course Packs Utilizing Inquiry-Based Learning

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ABSTRACT

With the decrease in face-to-face contact time between students and teachers within the online environment, course packs have ensured that they can still address learning. As evaluation plays a crucial role in embodying inquiry-based learning, the researcher sought to develop an evaluation tool to evaluate the designed course packs that utilize inquiry-based learning. The researcher used the qualitative developmental research method. The study participants were students who used the course packs and three (3) experienced faculty members in a flexible teaching-learning environment. A purposeful sampling technique was used in this study. The researchers used a structured interview guide, survey form, and actual data, which were analyzed thematically. Based on the results, learners should be supported by an inquiry-based learning strategy. In this way, it will help the students propose appropriate solutions in TLE, which will help them process information efficiently. In the TLE subject, one of the informants' main concerns is how students conceptualize different components of learning, especially since many operations, terms, and proceedings are done in the subject embedded in different lessons. Based on the reviewed course packs and themes that were examined from the semi-structured interview, the developed evaluation tool incorporated the following constructs: (1) support to learners (2) information-processing skills, and (3) conceptual understanding.during the in-depth interview. The conclusion of the study is that learner support, skills in information processing, and understanding of concepts are some of the particulars that should be considered when evaluating course packs utilizing inquiry-based learning.Therefore, it is hereby recommended that the developed evaluation tool can effectively be used in evaluating course packs using inquiry-based learning.

Keywords: inquiry-based learning, course packs, interview, evaluation tool

(Received: 17 June 2023; Revised: 04 July 2023; Accepted: 11 August 2023; Published: 29 September 2023)

Introduction

The role of teachers in making sure that the students are engaged in today's online world is crucial. With the influx of technologies used to support the teaching-learning process and complexity in using these ones are challenging to respond to the socio-economic needs of the students and its psycho-social aspects provided that the current health situation impacted how the people nowadays interact with others. Shenoy, Mahendra, & Vijay (2020) said that the impact of COVID-19 restrictions reduced the engagement of the students in the online environment. This is

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due to the reason that teachers and students spend more time in familiarizing the online technology rather than the lesson outcomes that the students must acquire.

In the study of Marin, Wang, & Sadaf (2018), students perceived that video based instruction, inquiry-based approaches, and interactive visuals and data introduced among course pack materials enhances the way students engage in learning; thus, making sure that through different forms of interaction and brain-based strategies, there is still an engagement happening among students despite the restrictions of interacting face-to-face. With the transition of the student-centered learning process in the entire duration, belongingness, cohesiveness, and supportiveness among students through incorporation of different methods in the inquiry-based teaching are usually the qualities that must be embodied in course packs, provided that in these times brought by the current health situation, the students and teachers highly depend on the online environment as means of connecting with each other.

With the decrease in face-to-face contact time between students and teachers within the online environment, course packs have made sure that they can still produce a harmonic manner of learning despite the happenings that are present in the world. In fact, the study of Shachar and Neumann (2010) asserted that through course packs and inquiry-based learning, it has contributed a significant influence in the academic performance of the students. Purlampu (2017) also asserted that inquiry-based learning has enabled the students to effectively apply learning in real-life context and has influenced the students to improve their academic performance. Serrano (n.d.) asserted that as inquiry-based learning is highly used in different course packs, evaluation plays a crucial role in making sure that the standards, principles, and guidelines of embodying an inquiry-based learning is still observed; hence, the researcher made an initiative to develop an evaluation tool to evaluate the developed course packs that utilize inquiry-based learning.

Objectives:

General Objective**:** To develop a model to evaluate the effectiveness of the developed course packs that utilize different teaching methods

Specific Objectives*: To develop a tool to evaluate the developed course packs that utilize* ***inquiry-based learning***

Review of Literature

This section presents the discussion of the variables under investigation. The sequence of presentation proceeds in this manner: inquiry-based learning; effectiveness of instructional materials, and; ADDIE (Assess, Design, Develop, Implement, and Evaluate) instructional design.

Inquiry-based learning. In course packs, inquiry-based learning focuses on the questions, ideas, and observations of students (Ernst, 2017). Because of inquiry-based learning, Panasan and Nuanchalerm (2010) asserted that through incorporating this type of activity, it has helped students connect the lesson content with the real-world happenings.

As Abdi (2014) emphasized that inquiry-based learning aids in the student achievement in different subject areas, including TLE, it's important to remember that inquiry-based learning

ISSN: 2278-4012, Volume:12 Issue:3, September 2023

is a process that increases the conceptual understanding of the students through:(a)Developing their questioning and skills;(b)Collaborating and communicating in different contexts;(c)Solving problems, proposing solutions, and tackling real-life questions and issues; and,(d)Participating in the innovation of knowledge.

Spronken-Smith and Walker (2010) determined that inquiry-based learning strengthens the links between teaching materials, teaching, and research; hence, the nature of inquiry-based learning highlights five (5) steps: (1) Ask questions;(2)Probe into various situations;(3)Conduct analyses; (4)Communicate findings in a written manner; and, (5)Think about the information and knowledge obtained

In addition, Friesen and Scott (2013) implied that there are numerous benefits in doing the inquiry-based learning as per their literature review conducted. In fact, they highlighted the different principles of the inquiry-based learning, which are as follows:(a)Learners are in the center of the teaching-learning process, while instructors, resources and technology are used as support to learners,(b)Information-processing skills become the primary focus of the type of learning,(c)Instructors facilitate the learning process,(d)Emphasis is placed on evaluating the development of information-processing skills and conceptual understanding instead of the content itself

The effectiveness of instructional materials. Teacher-made instructional materials can provide the driving force or incentive for children to explore and discover already stated objectives. This can be acquired by the manipulation of these instructional materials and will boost the interest of children toward achieving the stated objectives. Changing the pattern of teaching and learning by applying these teacher-made materials will excite learning and make them explore, by being creative and seeking for what is new in the usage of teacher-made instructional materials (Igbo & Omeje, 2014).

Abdullahhi (2010) claimed that instructional materials are tools locally made or imported that help to facilitate the teaching/learning process. Brown *et al.* (2005) argued that instructional materials are effective if it aids teaching as follows: (a) it promotes meaningful communication and effective learning; (b) they ensure better retention, thus making learning more permanent; (c) they help to overcome the limited classroom by making the inaccessible accessible; (d) they provide a common experience upon which late learning can be developed. They stimulate and motivate students to learn; and (e) they encourage participation especially if students are allowed to manipulate materials used. On the other hand, opined that instructional materials are effective if it promotes the following: (a) enhancement of the memory level of the students; (b) facilitate the teaching-learning process; (c) improve students' rate of accumulation; (d) serve as tools used by the teachers to correct wrong impression and illustration things that, learners cannot forget easily; (e) assist in giving sense of reality to the body of knowledge under discussions; (f) gives lessons a personal look and encourages teacher's creativity; (g) permit the students and teachers to experience in concrete terms the learning activities that can promote the idea of self-evaluation.

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ADDIE. Figure 1 shows the graphic presentation of the ADDIE instructional model. The **Analysis** phase is the *"Goal-Setting Stage."* The target students are the focus. The level of skill and intelligence of the students are matched. This is done to ascertain that what they already know won't be duplicated, and focus instead on topics and lessons that students have yet to explore and learn. This suggests that what the students already know are uncovered and what they should know after completing the course are evident (Kurt, 2018).

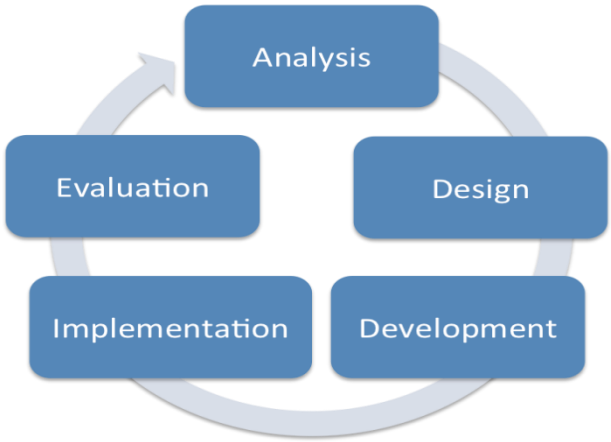


Figure 1.

Graphic presentation of the ADDIE model *(adopted from Kurt, 2018).*

The **Design** phase determines the goals, materials to be used to gauge performance, various tests, subject matter analysis, planning and resources. The focus is on learning objectives, content, subject matter analysis, exercise, lesson planning, assessment instruments used and media selection (Kurt, 2018).

The **Development** phase is the production and testing of the method used. Here, curriculum designers make use of the data collected from the two previous phases, and use this information to develop an instructional material that will relay what competences to be taught to students. This phase puts into action what was planned and brainstormed in the previous two phases. This phase includes three tasks, namely drafting, production and evaluation (Kurt, 2018).

The **Implementation** phase reflects the continuous modification of the instructional material to make sure maximum efficiency and positive results are obtained. Here, curriculum designers redesign, update, and edit the instructional material to ensure that it can be delivered effectively. In this phase, curriculum designers and students work together to train on new materials, so that the design can be continuously evaluated for further improvement. This phase gains much feedback both from curriculum designers and participants alike, and much can be learned and addressed (Kurt, 2018).

The last phase is **Evaluation**. Here, the instructional material is being subjected to meticulous final testing regarding the what, how, why, when of the things that were accomplished (or not accomplished) of the curriculum package. This phase can be broken down into two parts: Formative and Summative. The Formative phase happens while students and curriculum designers are conducting the study, while the Summative phase occurs at the end of the program. The main goal of the evaluation stage is to determine if the goals have been met, and to establish

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what will be required moving forward in order to further the efficiency and success rate of the instructional material (Kurt, 2018). The study is limited to the last phase of the ADDIE model.

Based on the foregoing studies, the researchers have proposed to develop a tool that would be helpful to evaluate the instructional materials or course packs used by the students and find out if the development of these materials has acquired specific competency skills utilizing inquiry based learning.

Methodology

Research Design

The research study will use qualitative developmental research method. This design emphasizes the study of learning as a result of designing unique instructional interventions (The Design-Based Research Collective, 2003). Specifically, this will use the second type of developmental study which is oriented toward an analysis of design, development, and evaluation processes, addressed either as a whole or in terms of a particular component (Richey, Klein & Nelson, n.d.). In the present study, the design, development and evaluation processes relate to the crafting of instructional materials for flexible teaching and learning environment. This would address each of the component of the ADDIE design.

In the field of instructional technology, development research is viewed as *"the process of translating the design specifications into physical form"* (Seels & Richey, 1994, p. 35). The process of producing instructional materials; thus, this research method is appropriate for this research activity. The final output is an instructional material for flexible teaching learning environment, responsive to the *"new normal."*

Respondents

The study participants are the students who used the course packs; and three (3) experienced faculty members in a flexible teaching learning environment.

Sampling Design

Purposeful sampling technique shall be used in this study. According to Patton (2002), purposeful sampling aims at identifying and selecting information-rich cases for the most effective use of limited resources. Using Cresswell and Plano Clark's (2011) argument, this suggests identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest. In addition to knowledge and experience, the availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner is likewise given importance (Bernard; 2002; Spradley, 1979). In this study, the participants are those who have rich knowledge and expertise in designing and developing instructional materials for flexible teaching learning environment. Moreover, it shall include the prospective clients of the instructional materials to be crafted.

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Research Instrument

To gather the necessary data, the researchers will use structured interview guide, survey form, and extant data. In a *structured interview*, the questions asked control the data elicited by the participants quite tightly. Here, the researchers follow a specific set of questions in a predetermined order with a limited number of response categories (Denzin & Lincoln, 2008). This is appropriate in the present study because the participants are only asked to give short responses to each ordered questions. They are asked the same set of questions for consistency. The interview follows a standardized and straightforward manner. Because the questions are routinely asked, a larger number of participants are accommodated in this study. The researcher records the responses according to a coding scheme established in conformity to the research question (Stuckey, 2018).

Data Gathering Procedure

The following steps shall be adhered to in gathering the needed data:

Requesting permission for the use of the developed course packs. Letters will be written addressed to the concerned faculty whose course packs shall be subjected to review.

Review of the gathered course packs. The course packs are reviewed based on the tools gathered from the literature.

Conduct of the semi-structured interview. The content specialist will be interviewed as to the conclusiveness of the topic and its suitability to the target clientele.

Data Analysis

Data gathered will be analyzed thematically. Thematic analysis is a form of pattern recognition within the data, where emerging themes become the categories for analysis (Fereday & Muir-Cochrane, 2006). This process involves examination of data and identification of themes that are central to the description of the phenomenon (Daly, Kellehear & Gliksman, 1997). Themes identified become the categories for analysis. On the other hand, extant data are analyzed by locating and investigating facts or trends in the existing documents (Witkin & Altschuld, 1995).

III. Results and Discussions

Support to learners

Based on the studies given, support to learners should be fostered by an inquiry-based learning strategy. In this way, it will help the students propose the right solutions to the right situations. As what informants have said:

> *"The coursepacks must help students think critically and creatively"* (Informant 3).

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> *"The students must be able to help students unleash their communication skills, especially sa TLE na dapat hindi lang more on hands-on, pero more on written communication sa [accomplishment ng] coursepacks"* (Informant 2).

Jerrim, Oliver, and Sims (2020) emphasized the benefits of inquiry-based learning as means of encouraging the learners to embody scientific method in different subject areas that will help the students in investigating different problems effectively; and, infusing inquiry-based learning is associated with the academic performance of the students. As metacognitive skills play a crucial role, inquiry-based learning helps the learners to foster support from the teacher (Nunaki, 2019).

Srisawasdi and Panjaburee (2019) asserted that inquiry-based learning aims to promote understanding and motivation of the students to learn different lesson contents; hence, embodying inquiry-based learning supports to the learning of the students by means of inducing questions that will encourage further investigation of the students should there be times where they encounter situations in different contexts.

Through inquiry-based learning in learning modules, it highlights different questions in a form of formative assessments that help students to bridge the different learning gaps that are present, especially in TLE subjects where the right and wrong practices must be distinguished (Grob, Holmeier, and Labudde, 2017).

Information processing skills

Especially in textbook and other learning resources, inquiry-based learning has been one of the most crucial strategies, especially in infusing the different elements of questioning in different learning activities (Jeong & Son, 2020). In this regard, data has been one of the most crucial things in incorporating to written materials, especially that it is urgent to put real-world data in coursepacks because it helps students process information in the most convenient manner (Erlina et al., 2018).

Chen, Huang, and Chen (2017) highlighted that as time passes by, there are many textbooks and written modules that have lengthy content; hence, there is a call that instead of emphasizing the what to learn skills, there must also be strategies where students must be able how to learn the different learning contents given. Especially in TLE subjects that call for *knowing more and more about less and less*, there is a need to help the students process different pieces of information easily. As what informants wit:

> *"Makahelp gyud ang data para sa mga students, especially na highy technical ang TLE"* (Informant 1). Translation: (These data are so helpful for students especially in highly technical courses like TLE).

> *"Especially karon na daghan kayo og mga mali na operations na mahitabo sa industry, importante and mubutang og mga necessary data*

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ug situations para makatabang sa mga students og pahibalo kung unsay dapat ug dili dapat buhaton" (Informant 3).

Conceptual understanding

Tan, Yangco, and Que (2020) asserted that through embodying the inquiry-based learning, it is a need to develop the way students are conceptualizing different pieces of information that will also help them organize different learning contents ensure further monitoring and evaluation. In the TLE subject, one of the main concerns of the informants is the way students conceptualize different pieces of learning, especially that there are many operations, terms, and proceedings done in the subject embedded in different lessons. Sumranwanich et al. (2019) highlighted that encouraging students to conceptualize learning within time restrictions will promote student engagement in different subject areas. As what the informants said:

"Students must be able to support a new idea to the existing ideas, so that a stronger reinforcement is built" (Informant 2).

"Brain-based strategies must be done, so that the different concepts are easily learned" (Informant 1).

Developed Evaluation Tool

Table 1 presents the developed evaluation tool for the course packs using inquiry-based learning. This incorporates the following constructs: (1) support to learners; (2) information-processing skills, and; (3) conceptual understanding.

Table 1
Tool Developed for evaluating course packs using Inquiry-Based Learning

	Yes	No	Remarks
The course pack…			
1. Connects the lesson content with the real-world happenings			
2. Allows students to think and investigate			
3. Encourages the students to determine the problems that are present in a specific situation given			
4. Initiates students to carefully propose solutions in the problems present			
5. Helps the students communicate findings in a written manner			
6. Enhances the critical and creative thinking abilities of students			
7. Entices brain-based strategies			
8. Makes use of activities that develops the information-			

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processing skills of the students			
9. Encourages the students to imbibe a sense of empathy when looking at the situations given			
10. Enables the students to reinforce the ideas established			
11. Shows an activity that helps students investigate problems in a specific lesson			
12. Helps students develop metacognitive skills			
13. Probes various situations through its application			
14. Analyzes situations from the given lesson activities			
15. Develops their questioning skills			

SUMMARY, CONCLUSION, and RECOMMENDATION:

In the conduct of the study, the following is the summary of the findings:

1. Based on the in-depth interview, it was found that support to learners, information processing skills, and conceptual understanding are the themes formulated during the in-depth interview.

2.Constructs on the developed evaluation tool concentrated on the themes formulated during the in-depth interview.

CONCLUSION

The conclusion of the study is that learner support, skills in information processing, and understanding of concepts are some of the particulars that should be considered when evaluating course packs utilizing inquiry-based learning.

RECOMMENDATION

Therefore, it is hereby recommended that the developed evaluation tool can effectively be used in evaluating course packs using inquiry-based learning in all subject areas.

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