

An Assessment of the Flexible Approach in Teaching of Science at Batangas State University ARASOF-Nasugbu: Input to Instructional Material Development

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Abstract

The study aimed to assess the flexible approach in teaching science as an input to the development of an instructional material in teaching of science for Bachelor of Secondary Education (BSEd) major in Sciences students of Batangas State University ARASOF-Nasugbu. The study employed both the descriptive and developmental research design utilizing 5 science faculty members, 25 second year, and 27 third year pre-service science teachers as respondents of the study. A questionnaire using a 4- point Likert Scale was used to collect data. The results revealed that the use of instructional material in the subject teaching of science plays an important role in helping students to become proficient in the field of teaching science. It also revealed that instructional materials enable students to adjust on their own pace and is of great help for teachers and students during pandemic. The study recommended that the developed instructional material in teaching of science be subjected for further refinement before it is used and future researchers may conduct a study on the enhancement of the content, instructional design, and the layout of the developed instructional material applying all the comments and suggestions given by the respondents to come up with an instructional material that will definitely be more appropriate for the course Teaching of Science.

Keywords: Content; Instructional Design; Instructional Material; Flexible Approach; Layout; Teaching of Science.

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1. Introduction

Education is a discipline through which community alters its desires; thus, a community will oscillate with the absence of education. Because of education, people incorporate the abilities to improve, unfold and remodel tradition also as the current social and scientific understanding on the continual development of the society.

The process of teaching-learning has been indivisible to people specially in classical times. The ruler of human minds gave unforgettable appellation on education, wisdom, and learning. The system in education is notably found on the question, what to teach and how to teach. "What to teach" simply means the materials in learning. The continuous use of learning materials switches from linguistic to scientific knowledge. The content options and subject from the numerous types of knowledge is subjected to social needs.

At the prevailing time, instructors are challenged of teaching young learners to reach the demands of an increasingly global and modern world, specifically in this time of pandemic. When the COVID-19 Pandemic spread in the country, the government of the Philippines implements ways that restrict the number of people flocking in public places or areas. This measure has interrupted the usual operation and functioning of school and universities. Every school administration in the country, both public and private education institutions have made other ways or strategies for students and instructors to continue with their classes until school is not possible for operation. With this, the Higher Education Institutions in the Philippines applied dynamic regulations for the continuous of education regardless of the closure such as the implementation of online learning that might be in terms of synchronous and asynchronous class. In line with this, the researchers, educators, and educational policy makers show increasing concern on the need for greater emphasis on student-centered science instructions, in response to the increasing issues on students' learning.

Knowledge and its application to improve the living conditions of the country is primarily the concern of progress in science courses at all levels. Society today holds teachers accountable in using the best practice of the academic learning of their students. Organizing and accounting their strategies and skills would slowly change the students learning with history as a guide. Schools would continue to have better and competent students if teachers would provide good instructions to groups of students in a classroom. The new model aims to increase the link between the students and their communities, bringing the school resources to bear in the complex ethical, civic, and technical decisions that all citizens will have to make.

Science teaching needs to become more flexible, responsive, and dynamic to meet the changing times [1,2]. As such, there has been a change in emphasis for science teaching. The how's of teaching science is not only limited to discovery and process approaches. Other methods, such as the use of material sources or instructional aids supplement the major methods where students learn both content and processes of science [3]. It can be said that the use of teaching tools and materials in the successful implementation of any education program is very important as they influence students' learning [4].

Instructional materials bring off such purpose as the addition of the range of experience accessible to students, supplement and complement the instructor's verbal explanations, thereby creating learning experience abundant

and providing the instructor with interest in an extensive variety of learning activities. Modules are becoming the most widely used learning materials in this time of pandemic, so it is important to prepare it intelligently. It has an impact in learning since using this material has already been spread in the whole world and many researchers have proved that the use of it has an effect in the process of learning of the learners all over especially in science [5,6].

This is the reason why the researchers assessed the flexible approach in teaching science as basis in the development and evaluation of a learning module. The researchers also subjected the module to evaluation to determine its quality. In doing so, they would be able to collect data that the developed learning modules in teaching of science might become very helpful in the teaching-learning process. Also, this will be an additional material to be used by the teachers for future learners.

The core of modularization is simply that learners should be at the central of the process of teaching and learning. It seeks for a classroom setting management through which learners are attentive and actively occupied in the construction of knowledge method and transfer in the part of teacher from transmitter of knowledge to students' learning facilitator. Modularization needs ceaseless follow-ups and assessment of learners' development in the entire module. Application of successful continuous examination gives the teachers in creating adjustments in educating and learning in reply to the evidence of assessment It will also assist the learners collect feedback about their understanding with advice on what method they can do. Basically, the execution of modularized curriculum should guarantee the understanding of active learning and continual assessment in higher education.

2. Objectives of the study

The study generally aimed to develop an instructional material in Teaching of Science for BSEd major in Sciences students of Batangas State University ARASOF-Nasugbu. Specifically, this study sought to answer the perceived needs of the students and instructors in the course teaching of science; the perception on the significance of instructional materials in the flexible mode of delivery of instruction; the evaluation of students and instructors on the developed instructional material in terms of content, instructional design, and lay-out; and last, the evaluation and suggestions of students and instructors in enhancing the proposed instructional material in Teaching of Science in terms of content, instructional design, and lay-out.

3. Materials and methods

Both the descriptive and developmental method of research were utilized in the present study. The developmental method was used in the design of the instructional materials. The descriptive research was used to find strategies to enhance the students' learning and to better understand the concept and ideas in the subject Teaching of Science. It was also used assessed how the instructional material affected the academic performance of the learners. The descriptive research design was also used in determining the effectiveness of the developed instructional material and at the same time describing the extent of the development of instructional material in the subject Teaching of Science.

The research respondents consisted of 5 science instructors, 24 second year students and 27 third-year students of Batangas State University ARASOF- Nasugbu.

The researchers constructed a survey questionnaire which was used as the primary tool in gathering the needed information and data relevant to the study. The questionnaire is composed of sets of questions that are carefully and properly designed to gather the needed information in this study. The researcher established its validity by subjecting it to evaluation of science teachers and later revising it as suggested.

The questionnaire was administered through Google forms sent online to the target respondents. To collect other information relevant to the study, the researchers prepared comprehensive questions to be responded by either strongly agree, agree, disagree, and strongly disagree. The respondent's responses were interpreted using a 4-point Likert Scale. The questionnaire's options range from Strongly Agree to Strongly Disagree to get a complete viewpoint of respondent's beliefs and thoughts. Responses were statistically analyzed using frequency and weighted mean.

4. Results and discussion

4.1 Assessment of the need of instructional materials in the course teaching of science

The students strongly agree that the use of instructional material in the subject teaching of science plays an important role in helping students to become proficient in the field of teaching science with a weighted mean of 3.76 and rank first among the criteria. This implies that students learn best where are instructional materials being used by the teachers during the teaching-learning process. Instructional material in the subject teaching of science will improve teaching and the learning process falls in second rank and has a weighted mean of 3.75 with verbal interpretation of strongly agreed. With a verbal interpretation of strongly agreed and ranked third among the criteria which states that the teachers and students must have a reliable material where they can rely on whenever they are teaching or studying science has a weighted mean of 3.69. Instructional material in the subject teaching of science will offer students an opportunity to increase their overall understanding on the course has a weighted mean of 3.67 with a verbal interpretation of strongly agreed ranks four among the criteria. This means that using instructional materials will help the students fully understand the lesson presented by the teachers. The incorporation of instructional material in the course teaching of science helps to develop successful curriculum and teaching approaches got a weighted mean of 3.63, a verbal interpretation of strongly agreed and last in the rank.

The responses of the instructors in their evaluation about the need of instructional material in the subject Teaching of Science revealed that the fifth statement which states that incorporation of instructional material in the course Teaching of Science helps to develop successful curriculum and teaching approaches ranks first among the criteria and has a weighted mean of 3.8 with a verbal interpretation of strongly agree. The use of instructional material in the subject Teaching of Science will improve teaching and learning processes; instructional material in the subject Teaching of Science will offer students an opportunity to increase their overall understanding on the course; the use of instructional material in the subject Teaching of Science plays an

important role in helping students to become proficient in the field of teaching science; and teacher and students must have a reliable material where they can rely on whenever they are teaching or studying science tied on the ranking with a weighted mean of 3.6 and with a verbal interpretation of strongly agree.

The result indicating there is inadequacy of instructional materials corroborates the findings of author in [7]. Further, the author in [8] found in their study that during lockdown period of COVID-19 pandemic, some teachers uploaded readable lecture handouts, and others gave full reference books, for reading to facilitate online learning. It was also found that preparation of handouts required extra work which some teachers were not ready to do.

4.2 Assessment on the significance of instructional material in the flexible mode of learning

The students strongly agree that instructional material enable students to adjust on their own pace of learning with a weighted mean of 3.71 and ranks first among the criteria. The criteria which states that instructional material in flexible mode of learning are substantial tools needed for a more successful teaching and learning process; instructional material is one of the most widespread and recognize material that can be shared across its own academic discipline and/or others; and the use of instructional material in teaching and learning is of great help for teachers and students in the midst of pandemic tied on the ranking with a weighted mean of 3.67 and with a verbal interpretation of strongly agree. Last in the rank is the criteria which states that instructional material is detailed enough for a student to progress through the instruction without an instructor. It has a weighted mean of 3.57 and with a verbal interpretation of strongly agreed.

The response of instructors show that they are strongly agree on the use of instructional material in teaching and learning is of great help for teachers and students during pandemic with a weighted mean of 3.8 and ranks first among the criteria. Instructional material in flexible mode of learning are substantial tools needed for a more successful teaching and learning process; instructional materials enable students to adjust on their own pace of learning; and instructional material is detailed enough for a student to progress through the instruction without an instructor tied on the rank with a weighted mean of 3.6 and with a verbal interpretation of strongly agree. Last in the rank is the criteria which states that instructional material is one of the most widespread and recognized material that can be shared across its own academic discipline and/or others. It has a weighted mean of 3.4 and with a verbal interpretation of agree

The respondents' perception on the significance of instructional modules in the flexible mode of delivery of instruction generally revealed that instructional material is very valuable. This finding is supported by the reports of authors in [9]. The results that the researchers got contrasted with the findings of K. Tosh, A. Woo, and S. Doan [10] who reported that the digital materials they used most commonly did not fully connect to the content, concepts, and learning activities of their main curricula.

4.3 The evaluation of the developed instructional material

The findings of the study on the perceived needs of the students and instructors in the course teaching of science revealed that an instructional material is needed in the course, whereby respondents cited the desirable

characteristics of such material. With respect to the respondents' perception on the significance of instructional modules in the flexible mode of delivery of instruction, it was found that an instructional material is very valuable.

These findings spearhead the researchers in preparing an instructional material that can be used in the course teaching of science. Afterwards, it was subjected to evaluation and the result of the evaluation is presented hereunder.

In terms of content, both the teachers and the students forwarded positive evaluation regarding the content of the module. They indicated that the content is aligned with the curriculum and benchmarks for subject area, properly sequenced, has clear and concise learning objectives, accurate and helps to achieve the program educational objectives, students' outcomes, and intended learning outcomes specified in the course, updated with the level of complexity or difficulty of content appropriate.

The instructional design of the module also received highly favorable evaluation from students and teachers. They specified that instructional design accommodates diverse learning styles and ability levels, engages students to turn out to be keenly engaged to learn and discover, material includes correct and suitable assessment, each direction in the instructional material is clear and comprehensive enough for learners to carry out and accomplish the required tasks, the extent of opportunities and moments for collaborations to make learning a lot easier is evidently shown and demonstrated in the instructional material. With respect to the module's layout, both students and instructors' evaluation show that they like the instructional material. In particular, they strongly agree that the color, font size, spacing, and style of illustrations are appropriate for the skills of learners. Further, they believe that the instructional material give synergy, interactive and gives high-level quality of sensory events and experiences to readers, and the layout is clear and intuitive that provides students opportunities to find what they need tied. Respondents also pointed out that the construction and format of the instructional material permit learners to access content and explicitly ideas and sequences. They also notice that the graphics and titles used matches the content of the developed instructional material. The respondents also give suggestions to enhance the quality of the developed instructional material. In particular, they said that the material's instruction should follow a logical hierarchy of skill and knowledge development. In addition, the content must involve real- life problems to allow students to reflect on the university core values. Lastly, they suggested to make use of video presentations for better understanding of concepts.

5. Conclusions

The findings showed out that both instructors and students strongly indicated a developed instructional material in teaching of science is absolutely a need for both to increase their overall understanding about the course. Moreover, respondents believed that an instructional material in teaching of science is very relevant and valuable in teaching and learning the course. In addition, the developed instructional material in the course teaching of science was evaluated to have acceptable quality in terms content, layout, instructional design. However, the additional suggestions forwarded by respondents signify the need for the enhancement of the quality of the proposed instructional material.

6. Recommendations

Based on the data gathered and conclusions, the researchers recommend that the developed instructional material in teaching of science be subjected for further refinement before it is used. Future researchers may conduct a study on the enhancement of the content, instructional design, and the layout of the developed instructional material applying all the comments and suggestions given by the respondents to come up with an instructional material that will be more appropriate for the course teaching of science.

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