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Learning Experiences and Challenges in Teaching Measures of Central the Tendency in the New Normal

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Abstract: This paper aims to identify teachers' learning experiences and challenges in teaching measures of central tendency in the new normal. The researchers utilized a questionnaire to investigate students' learning experiences in terms of content, process, and assessment; and, lastly, the teachers' challenges in teaching measures of central tendency. A descriptive design with purposeful sampling was used in this study. The analysis of the data obtained from the level of learning experiences of the mathematics students in terms of measures of central tendency, as perceived by the teacher, indicates that in content, learning enhancement when illustrative examples support the topics and the practice tasks are suited to their level. The students don't know much about certain areas of statistics, which makes it hard for the teacher to teach measures of central tendency. Based on the results of the study, the researchers suggest that teachers use more interesting teaching materials that can be used in the classroom to help students learn statistics, especially Measures of Central Tendency. Also, they might go to workshops and seminars to learn how to make good teaching materials for teaching and learning statistics.

Keywords: ASGI assessment tool, challenges, learning experiences, least learned competencies, measures of central tendency, Instructional Material

1. INTRODUCTION

The world's educational landscape has been significantly impacted by Coronavirus-19. In March 2019, all schools in the Philippines were canceled due to the pandemic's danger. Finding efficient means to provide education has become a top priority as schools and institutions worldwide struggle with the impacts of COVID-19, especially because face-to-face learning is no longer permitted. (Almoite & Pacursa, 2022). The phrase "new normal" has been used most since the epidemic, and the rising usage of online learning resources is the new normal in education. Educational institutions worldwide are looking for online learning platforms to carry on educating pupils. The education paradigm has changed, and online learning is the foundation of this change. This is the new normal. (Velinova-Sokolova, 2021)

A revision of education within the curriculum studies perspectives is crucial considering the impending new normal post-COVID-19 time. In terms of curriculum, it offers a preview of the potential and difficulties ahead. Education specialists will be more knowledgeable about the key issues, choices, and solutions that need to be carefully explored as we enter the new era by reviewing the curriculum options in terms of purpose, content, strategy, and evaluation (Cahapay, 2020). Most public schools nationwide choose modular distance learning delivery as their student's preferred method of instruction. With this teaching method, children received self-learning kits and modules that they were to complete each week at home with the assistance of their parents and guardians. Teachers also ensure open communication with parents and kids and regularly monitor their needs. . However, it is undeniable that the new normal for education contains problems and dangers. (Evangelicom et al., 2021).

Mathematics is a different topic that is taught in every school. It is a tool for all other sciences to advance. We use mathematics in all aspects of our lives, whether we realize it or not. Most students around the world, on the other hand, despise maths. Most students regard mathematics as a difficult subject because of the adversarial teaching style, difficulty in following instructions, difficulty comprehending the subject, and difficulty recalling equations and problem-solving strategies. (Gafoor & Kurukkan, 2015). Mamolo, (2022) states that the "New Normal" in instruction in Philippine schools welcomes online learning due to the pandemic's extensive effects.

Results indicate that throughout the 6-week pilot test of synchronous online learning, students' motivation and self-efficacy in mathematics have considerably reduced. Before and after the implementation, students' anxiety remained "High," indicating that they were afraid of and unsure of the new standard for instruction. Additionally, findings revealed that some of the main causes of students' challenges in learning the subject matter and transitioning to the "New Normal" were their sluggish and unpredictable Internet connection, a lack of motivation to perform self-study, many activities at home, and chores.

Statistics has long been regarded as one of the most difficult subjects for high school students. Because of the intricacy of statistical principles, statistics is a complex topic. Understanding statistical concepts are distinct from understanding statistical mechanics, which entails entering numbers into the appropriate formula.

Students who grasp statistical principles can read and use tools such as percentages, ratios, and spread measures. Also included are tables, graphs, maps, central tendency, and variability. The measurement of the central tendency notion

is one of the statistical concepts that students frequently struggle with (Siew & Saidi, 2018).

Chinamasa et al. (2012), students make mistakes interpreting measures of central tendency such as the mean (31%), median (95%), and mode in context (61%). Students' use of memorization, textbook definitions, and median as a phrase that occupies a central place when they are in order can account for this dispersion of errors.

Moreover, according to Santos & Pedro, (2013), the scenario is equally troublesome in terms of the median, idea of grades 7, 8, and 9. According to research, grade 12 students and potential teachers have difficulty grasping and interpreting this notion (grades 1 to 6). Certain prospective teachers highlight the absolute frequencies' central value when calculating it. In contrast, others confuse this idea with the mode, and the most common error is calculating the central value without arranging the data.

Hence, the researchers are passionate about this topic for several reasons: first is to identify the student's learning experiences in learning measures of central tendency in the new normal as perceived by the teachers. The second is to develop instructional materials for measures of central tendency that would be beneficial for teaching and learning mathematics in the new normal. The third is to assess the effectiveness of the contextualized instructional materials and the intervention that this material requires to become more effective in the new normal.

The information gathered will be assessed and quantified based on the least learned competencies of learning measures of central tendency. Additionally, this study aims to identify the level of the learning experience of mathematics students in learning measures of central tendency as perceived by the teacher. The challenges teachers face while teaching measures of central tendency. This study will assist researchers in better comprehending the effectiveness of the developed instructional materials and the intervention that this material requires to become more efficient in a new standard learning setting.

2. THEORETICAL FRAMEWORK

The theory of constructivism theory supported this study. Constructivism is a learning philosophy that asserts that people actively construct or create their knowledge and that reality is shaped by the learner's experiences (Mcleod, 2019). In addition, learners are active participants in their learning journeys, according to constructivist theory, and knowledge is produced via experiences. As events unfold, everyone reflects on their practice and integrates new concepts into their existing knowledge. Learners create schemas to arrange their newly learned information. Dewey, Piaget, Vygotsky, Gagne, and Bruner used this paradigm in their learning theories (Kurt, 2021).

Constructivism is a philosophy of learning that clarifies how people build knowledge. Knowledge production is a dynamic, not a static, process. This is because, in mathematics, constructivist theory gives the ability to be stored in students' minds and actively construct new knowledge from experience and expertise. Students must grasp what they know and what they need to learn mathematics effectively, and this drive will help them learn more (Díaz, 2017).

Additionally, the constructivist paradigm, which has distinguished itself lately in the educational practice, promotes the necessity for methodological and actional alternatives, the intertwining and combining instructive-educational strategies and their components.

Whereas the essence of constructivism, that is, the creation of the possibility for the student to "build" his knowledge by himself, thanks to independent, individual activity, but also the necessity of relating his own subjective knowledge to that of the group and class, constructivism promotes both the independent and group activity based on cooperation, collaboration, and co-building of knowledge (Mogonea & Mogonea, 2014).

The Cognitivist learning theories supports this study the fundamental goal of cognitivist learning theories is to transfer knowledge to the learner as efficiently as possible by allowing the learner to adopt the most effective cognitive techniques to encode information. As a result, an instructional designer must consider both the learning task requirements and the learner's current capabilities. The designer can evaluate the learner's current level of learning skills and the most effective presentation of information by undertaking a cognitive task analysis. Goal setting, planning, and self-monitoring should be encouraged because cognitivist theories favor the learner's active involvement. It can be beneficial for designers to provide opportunities for learners to organize new information in ways that connect to existing knowledge or personal experiences when processing further information (Michela, 2020).

Moreover, this study used the ADDIE Model. The ADDIE model design is an instructional paradigm that guides the development of software and learning materials based on user requirements. This model refers to teaching models frequently used as the foundation for other instructional design models (Stapa & Mohammad, 2019). Furthermore, according to the study by Nadiyah & Faaizah, (2015) the ADDIE model is the most used instructional design framework. It provides a flexible set of guidelines to assist instructional designers in creating practical support tools in five (5) phases: analysis, design, development, implementation, and evaluation. Rapid prototyping is one of the advancements introduced to this methodology.

It enables continual assessment and feedback while developing materials. In addition, according to Hill & Jordan, (2018), Good quality design with explicit learning objectives, carefully structured content, controlled workloads for faculty and students, integrated media, relevant student activities, and assessments sightly related to intended learning outcomes are some of the benefits of the ADDIE.

But unfortunately, the study will focus more on the analysis, design, and development phases of the instructional material due to the limited time available for the study.

3. RESEARCH METHODOLOGY

The researcher used a descriptive research design. The researchers conducted the study at different junior high schools in Butuan City. The study participants were the grade 7 mathematics teachers selected from the different schools in different districts in Butuan City Division. The researchers used a purposive sample to collect the necessary data from teachers in different districts in Butuan City. The collected data were recorded, tabulated, and statistically treated for analysis, interpretation, and presentation. To achieve this, the following statistical tools were utilized:

A frequency and percentage computation were used to identify the least learned competencies of the students in learning measures of central tendency.

A Weighted Mean was used for determining the teachers' learning experiences, as well as the challenges encountered in teaching measures of central tendency.

4. RESULTS AND DISCUSSION

Table1. Learning experiences of the mathematics students in measure of central tendency as perceived by the teacher

Variable	Indicators	Mean	Verbal Description
Content	1. The content of each lesson is simple and easy to understand	3.47	Agree
	2. The topics of each lesson are fully discussed.	3.47	Agree
	3. Illustrative examples support the topics, and the practice tasks are suited to the level of the students.	3.63	Strongly Agree
	4. Each topic is given equal emphasis in the lesson.	3.60	Strongly Agree
Process	1. The activities are interesting.	3.40	Agree
	2. The activities help understand the concept clearly	3.47	Agree
	3. The different activities promote the retention of information to students.	3.50	Agree
	4. The activities encourage student creativity	3.40	Agree
	5. The activities are well organized and structured.	3.57	Strongly Agree
Assessment	1. Activities are in line with the intended learning outcomes of the student.	3.67	Strongly Agree
	2. The assessment uses multiple sources of information.	3.47	Agree
	3. A clear specification of the criteria for judging students' performance is provided.	3.40	Agree
	4 The assessment is fair to everyone.	3.57	Strongly Agree
	5. Assessment has used a variety of assessment procedures.	3.37	Agree
	Average mean	3.50	Agree

1.00-1.50-Strongly Disagree, 1.51-2.50-Disagree, 2.51-3.50-Agree, 3.51-4.00-Strongly Agree

Table 1 shows the learning experience of mathematics students in measures of central tendency as perceived by teachers. The table shows that in terms of content, the indicator with the highest mean is "Illustrative examples support the topics, and the practice tasks are suited to the level of the students, which has a mean of 3.63, which has a verbal description strongly agree.

This contradicts the study conducted by McGrath, (2014) that content areas may require further attention (e.g., distribution of means) for students to understand the material. Student queries tended to be focused on certain

academic areas within the course. Several pupils, for example, had queries concerning mean distribution and one-versus-two-tailed tests Students also requested guidance on preparing for future tests and how to create APA-style conclusions. Furthermore, in terms of process in the Learning experiences of the mathematics students in measure of central tendency as perceived by the teacher is "The activities are well organized and structured, which has a mean of 3.57 and has a verbal description of Strongly agree. This connects to the study of Meitrilova & Putri, (2020) which Determines the function of activities in learning central tendency materials (mean, median, and mode), which should aid students in comprehending the notion of statistical learning in grade VIII.

The findings of the learning experiment suggest that the provided questions can help students understand the central tendency notion and its significance. Students make mistakes in exercises because they are not diligent while reading the information on the questions, have poor counting skills, and don't retain or grasp the contents provided. Moreover, in terms of assessment, the learning experiences of the mathematics students in measure of central tendency as perceived by the teacher is "Activities are in line with the intended learning outcomes of the student which has mean of 3.67 and has a verbal description of strongly agree.

This connects to the study of Bakkenes et al, (2010) the substantial relationships between learning activities and learning outcomes discovered in this study suggest qualitative variations in learning activities. When comparing the current study's teacher learning activities to research on student learning and student-teacher learning, it becomes clear that meaning-oriented learning (e.g., attempting to extend one's understanding of one's own practice and new ideas, and attempting new practices based on that understanding) is an important aspect of both teacher and student learning. In student and teacher learning, trying to understand why things work the way they do is a distinct learning pattern.

Table 2. Challenges encountered by the teacher in teaching measures of central tendency

Variable	Indicators	Mean	Verbal Description
Challenges	Lack of content knowledge.	2.10	Disagree
	Inadequate teaching materials	2.50	Disagree
	Lack of training on the content	2.23	Disagree
	Students lack of prior knowledge on certain topics in statistics.	3.30	Agree

Table 2 shows the challenges of teachers in teaching measures of central tendency. The table shows that challenges encountered by teachers are students' lack of prior knowledge of certain topics in statistics, which has a mean of 3.30, which has verbal discrimination of strongly agrees.

This connects to the study of Gafoor & Kurukkan, (2015). According to students' reports and teachers' perceptions, a major source of students' difficulty with mathematics is a lack of prior knowledge. Learning mathematics in upper grades is difficult, if not impossible, without relevant prior knowledge. Teachers have reported that it is difficult to offer more time for renewing previous knowledge based on the content and organization of the existing curriculum. However, teaching seventy-five percent of students unfamiliar with newer topics is pointless. Mechanical or rote learning is promoted when students are taught without prior knowledge.

Based on the findings of the study, what contextualized instructional materials can be developed?

Conclusion and Recommendations

Based on the findings study following conclusions were drawn:

First, the least-learned competency in learning the measures of central tendency is calculating the ungrouped and grouped data.

Second, the learning experiences of the grade 7 students, as perceived by the teachers, in terms of content topics are supported by illustrative examples. The practice tasks are suited to their level, while in terms of process, the activities are well organized and structured. In terms of assessment, the activities align with the student's intended learning outcomes.

Third, as the challenges encountered by the teachers in teaching measures of central tendency, students lack prior knowledge on certain topics in statistics.

Fourth, as to the findings of the study, the contextualized instructional materials developed for measures of central tendency utilizing the arrange, solve, graph, and interpret (ASGI) assessment tool will be

effective and beneficial to both teachers and students because they will use ASGI evaluation methods to aid students in understanding statistics, particularly measures of central tendency.

The researchers conclude with recommendations after collecting, evaluating, and interpreting the data:

1. Teachers may utilize more engaging instructional materials that can be implemented into classes and improve students' learning in statistics, particularly in Measures of Central Tendency.

2. Teachers may attend a series of training and seminars to gain knowledge and skills in creating effective instructional materials for teaching and learning statistics, not just in statistics but in other areas.

3. Teachers may use instructional material that would help address the lack of prior knowledge of students in statistics.

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