



An Evaluation of General Mathematics Course using Countenance Stake Evaluation Model

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ABSTRACT: The entrance exam score results of students at one university in Central Mindanao, Philippines based from the OSAT – A Test revealed that most of the students belong to the dull normal to average IQ category. In this study, through countenance stake evaluation model by Robert Stake, the General Mathematics Course at Senior High School was evaluated checking if the goals are being met through (1) identifying the suitability of learning planning and (2) the learning process, (3) the appropriateness of learning assessments, and (4) the student learning outcomes which involves the antecedents (context), transactions (process), and outcomes (output). The data gathered were the admission test results of the students, the curriculum map from the Department of Education, the curriculum map from the school, the learning plans which includes the lessons and projects, and the formative and summative assessments from the teachers teaching General Mathematics which was content validated by five Mathematics experts and was computed through Aiken’s Validity Index. The evaluation showed that the antecedent component is somehow evident as evidenced by the lesson plans for the first quarter. The transaction component, was somehow efficient as evidenced by the Teacher’s Efficiency Scale results. Finally, the outcome component showed that most of the students are still in the average level noting also that as majority of the students before belong to the lower half of the classification (dull normal to below average), now, majority of the students are in the higher half of the classification (above average to genius).

KEYWORDS: Countenance Stake Evaluation model, Evaluation General Mathematics Course.

INTRODUCTION

General Mathematics is an 80-hour subject for Grade 11 students in the K to 12 Basic Education Curriculum. It covers topics involving rational, exponential, and logarithmic functions as well as business related problems and logic. Though in the curriculum, there is no prerequisite mentioned, technically the prerequisites are the lessons in elementary until Grade 10. Since the K to 12 framework follows the spiral progression, these lessons were already taught in the former years however it becomes more challenging as the grade level of the student increases.

Mathematics is said to be one of the most difficult subjects. According to the entrance exam results of students at one university in Central Mindanao, Philippines, out of 733 students, 1 or 0.1% belong to dull normal, 158 or 22% are below average, 485 or 66% are average, 70 or 10% are above average, 17 or 2% are bright, and 3 or 0.4% are superior. As this subject is said to be difficult, teachers play a big role in making this subject easier through employing different strategies in their class. Aside from that, exploring the curriculum standards, objectives, lesson planning, and assessments can further help in making the subject easier.

Moreover, it has been narrated from the study of Tompong and Jailani (2019) that there are three stages in learning, namely, preparation, implementation, and assessment. The preparation phase is where lesson plan materials, learning methods, objectives, and activities are mentioned and done. The second phase is the implementation phase where the materials being prepared are implemented. The final phase is the assessment wherein this happens before or during and after the exam also known as formative and summative assessments respectively.

In this study, through systematic process, the General Mathematics Course at Senior High School will be evaluated to check if the goals are being met through (1) identifying the suitability of learning planning and (2) the learning process, (3) the appropriateness of learning assessments, and (4) the student learning outcomes. It will be evaluated through the countenance stake evaluation model by Robert Stake published in 1967 which is a widely used research design in evaluating the learning process. This model involves the antecedents (context), transactions (process), and outcomes (output).



METHODS

This study employed the descriptive evaluation research with a quantitative approach supported by qualitative data wherein the object being evaluated was the implementation of General Mathematics Course at one university in Central Mindanao, Philippines. The evaluation approach used is the Countenance Stake Evaluation Model of Robert Stake published in 1967.

An adopted lesson plan checklist based from the Department of Education Order Number 42, series of 2016 entitled "Policy Guidelines on Daily Lesson Preparation for the K to 12 Basic Education Program" and Teachers' Efficiency Scale checklist from one of the universities in Central Mindanao validated by five mathematics experts was utilized to find out the content validity of the instrument. The five-point Likert scale used were 5 – Excellent, 4 – Very Good, 3 – Good, 2 – Fair, and 1 – Needs Improvement. Using the Aiken's Content Validity Index, the content validation resulted to a value of 0.81 which says that the instrument is very valid.

Moreover, the data gathered were the admission test results of the students, the curriculum map from the Department of Education, the curriculum map from the school, the learning plans which includes the lessons and projects, and the formative and summative assessments from the teachers teaching General Mathematics at one university in Central Mindanao, Philippines. The learning plans were evaluated by five Mathematics experts using the four-point Likert Scale namely, 4 – Very Evident, 3 – Somehow Evident, 2 – Rarely Evident, and 1 – Not Evident. The teachers' efficiency scale was evaluated by five Mathematics experts using the four-point Likert Scale namely, 4 – Very Efficient, 3 – Somehow Efficient, 2 – Rarely Efficient, and 1 – Not Efficient.

After gathering the evaluation results from the experts, the researcher computed for the mean and standard deviation and interpreted the data. Aiken's Validity Index as narrated by Irawan and Wiluyeng (2020) was calculated through the formula, wherein V = Validity of Aiken's Index, S = The score awarded by the rater minus the lowest possible rating a rater can award, C = The highest possible rating a rater can award, and N = The number of raters rating the test questionnaire. The Validity of Aiken's Index or V obtained in each item is then classified by Irawan and Wilujeng (2020) into different categories with respective decisions, namely $0 \leq V \leq 0.4$ as Invalid, $0.4 < V \leq 0.8$ Medium Validity, and $0.8 < V \leq 1$ Very Valid.

RESULTS AND DISCUSSION

A. Validation Results

Table 1.a and 1.b shows the content validity results of the created questionnaires to validate the lesson plan and to check the implementation of the lesson plan.

Table 1.a: Aiken's Content Validity Result of the Lesson Plan

Item Number	Aiken's Index Item Validator 1	Aiken's Index Item Validator 2	Aiken's Index Item Validator 3	Aiken's Index Item Validator 4	Aiken's Index Item Validator 5	S1	S2	S3	S4	S5	$\sum S$	V	Decision
1	4	3	5	5	5	3	2	4	4	4	17	0.85	Very Valid
2	4	2	4	5	4	3	1	3	4	3	14	0.70	Medium Valid
3	4	3	5	4	5	3	2	4	3	4	16	0.80	Medium Valid
4	5	2	5	4	5	4	1	4	3	4	16	0.80	Medium Valid
5	5	3	5	4	5	4	2	4	3	4	17	0.85	Very Valid
6	5	3	5	4	5	4	2	4	3	4	17	0.85	Very Valid
7	5	1	5	5	5	4	0	4	4	4	16	0.80	Medium Valid



8	4	1	5	5	5	3	0	4	4	4	15	0.75	Medium Valid
9	5	3	5	5	5	4	2	4	4	4	18	0.90	Very Valid
10	5	1	5	4	5	4	0	4	3	4	15	0.75	Medium Valid
Overall												0.81	Very Valid

Table 1.a presents the Aiken’s Validity Index of the Tool used to measure the content of the lesson plan created by General Mathematics teachers. This further reveal that it has an overall validity of 0.81 thereby implying that the questionnaire is very valid. Moreover, item number 9 got the highest validity of 0.90 which is interpreted as very valid. This is followed by item numbers 1, 5, and 6 with a validity of 0.85 which is still interpreted as very valid. On the other hand, item numbers 3, 4, and 7 got a validity of 0.80 which is interpreted as medium valid. In addition, item numbers 8 and 10 got a validity of 0.75 which is still interpreted as medium valid. Finally, item number 2 got the lowest validity of 0.70 but is interpreted as medium valid.

Table 1.b: Aiken’s Content Validity Result of the Teaching Environment Survey

Item Number	Aiken’s Index Item Validator 1	Aiken’s Index Item Validator 2	Aiken’s Index Item Validator 3	Aiken’s Index Item Validator 4	Aiken’s Index Item Validator 5	S1	S2	S3	S4	S5	$\sum S$	V	Decision
1	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
2	5	3	5	5	5	4	2	4	4	4	18	0.90	Very Valid
3	5	3	5	5	5	4	2	4	4	4	18	0.90	Very Valid
4	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
5	5	3	5	5	5	4	2	4	4	4	18	0.90	Very Valid
6	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
7	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
8	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
9	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
10	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
11	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
12	5	3	5	5	5	4	2	4	4	4	18	0.90	Very Valid
13	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
14	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
15	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
16	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
17	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
18	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
19	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
20	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
21	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
22	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
23	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
24	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
25	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
26	5	2	5	5	5	4	1	4	4	4	17	0.85	Very Valid
Overall												0.86	Very Valid



Table 1.b presents the Aiken’s Validity Index of the Tool used to measure the content of the Teaching Environment Survey implemented by General Mathematics teachers. This further reveal that it has an overall validity of 0.86 thereby implying that the questionnaire is very valid. Moreover, item numbers 2, 3, 5, and 12 got the highest validity of 0.90 which is interpreted as very valid. On the other hand, item numbers 1, 4, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, and 26 got a validity of 0.85 which is still interpreted as very valid.

B. Antecedent

Table 2 presents the lesson plan findings. The lesson plan serves as the antecedent since the lesson plan contains all the information to be used in the implementation phase.

Table 2: Aiken’s Content Validity Result of the Lesson Plan

Items	Mean	SD	Interpretation
1. Review of previous lesson/s or presenting the new lesson The part connects the lesson with learners’ prior knowledge. It explicitly teaches the learners how the new lesson connects to previous lessons. It also reviews and presents new lesson in a systematic manner	2.49	.812	Rarely Evident
2. Establishment of a purpose for the lesson Establishing a purpose for the lesson will motivate the learner to learn the new lesson. It encourages them to ask questions about the new topic and helps establish a reason for learning the new lesson	2.49	.946	Rarely Evident
3. Presentation of examples or instances of the new lesson Presenting examples/instances of the new shows instances of the content and competencies. This is also where the concepts are clarified	2.77	.511	Somehow Evident
4. Discussion of new concepts leading to first formative assessment Discussing new concepts leads to the first formative assessment. Teachers shall prepare good questions for this part. The teacher will listen to the answers of learners to gauge if they understood the lesson. If not, then they re-teach. If the learners have understood the lesson, the teacher shall proceed to deepening the lesson	3.06	.585	Somehow Evident
5. Continuation of the discussion of new concepts leading to the second formative assessment Continuation of the discussion of new concepts leading to the second formative assessment that deepens the lesson and shows learners new ways of applying learning. The teacher can use pair, group, and team work to help learners discuss the lesson among themselves. The learners can present their work to the class and this serves as the teacher’s way of assessing if the concepts are solidifying and if their skills are developing	2.86	.728	Somehow Evident
6. Developing mastery which leads to the third formative assessment Developing mastery, which leads to the third formative assessment, can be done through more individual work activities such as writing, creative ways of representing learning, dramatizing, etc. The teacher shall ask learners to demonstrate their learning through assessable activities such as quizzes, worksheets, seat work, and games. When the students demonstrate learning, then proceed to the next step. The teacher can add activities as needed until formative assessment shows that the learners are confident in their knowledge and competencies	2.80	.628	Somehow Evident
7. Practical applications of concepts and skills in daily living Finding practical applications of concepts and skills in daily living which can develop appreciation and valuing for students’ learning by bridging the lesson to daily living. This will also establish relevance in the lesson	1.94	.972	Rarely Evident
8. Generalizations and abstractions about the lesson	2.09	1.013	Rarely Evident



Making generalizations and abstractions about the lesson will conclude the lesson by asking learners good questions that will help them crystallize their learning so they can declare knowledge and demonstrate their skills

9. Evaluation of learning

Evaluating learning is a way of assessing the learners whether the learning objectives are met. Evaluation should tap into three types of objectives.	2.77	.739	Somehow Evident
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10. Additional activities for application or remediation

Additional activities for application or remediation will be based in the formative assessments and will provide children with enrichment or remedial activities. The teacher should provide extra time for additional teaching activities to those learners demonstrating that they have difficulties with the lesson.	2.06	1.141	Rarely Evident
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Overall	2.533	0.808	Somehow Evident
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Legend: 3.50 – 4.00 Very Evident, 2.50 – 3.49 Somehow Evident, 1.50 – 2.49 Rarely Evident, 1.00 – 1.49 Not Evident

Table 2 presents the findings in the lesson plan after careful evaluation by five experts in the field of Mathematics. This further reveal that the lesson plans for the first quarter made by the teachers teaching General Mathematics are somehow evident with an overall mean of 2.533.

Moreover, item number 4 “Discussion of new concepts leading to first formative assessment” got the highest rated mean of 3.06 which is interpreted as somehow evident. This is followed by item number 5 “Continuation of the discussion of new concepts leading to the second formative assessment” with a mean of 2.86 which is interpreted as somehow evident. The third of which is item number 6 “Developing mastery which leads to the third formative assessment” with a mean of 2.80 which is interpreted as somehow evident.

On the other hand, item number 7 “Practical applications of concepts and skills in daily living” got the lowest rated mean of 1.94 which is interpreted as rarely evident. Followed by this is item number 10 “Additional activities for application or remediation” with a mean of 2.06 which is interpreted as rarely evident. Finally, item number 8 “Generalizations and abstractions about the lesson” got a mean of 2.09 which is interpreted as rarely evident.

The results above present that teachers are able to discuss concepts leading to formative assessments however they rarely transform these into real-life practical applications, form generalizations and abstractions, and give additional activities for application or remediation. Moreover, as validators have noted, the evaluation of the lesson plans reveals both strengths and areas for improvement. On the positive side, the use of cooperative learning is appreciated, and the alignment of the DepEd curriculum guide to the school curriculum and performance tasks is evident. Additionally, students are encouraged to be interactive during lessons, which is crucial for engagement. However, several issues need to be addressed such as the alignment between the learning competencies, lesson plans, and curriculum map which are inconsistent, with some competencies missing or inadequately covered. Moreover, the assessments often focus on memorization rather than critical thinking, and the lesson plans do not fully adhere to the expected standards. Further, there is a lack of clear real-life applications in some lessons, and instructions and activities could be better sequenced and more detailed to improve the overall lesson effectiveness. Finally, improvements in test quality and evaluation methods are also necessary to ensure better learning outcomes.

C. Transaction

Table 3 presents the teaching environment survey findings. The results below showcase the rating during the implementation of the lesson plan.



Table 3: Teaching Environment Survey

Statements	Mean	SD	Interpretation
A. THE TEACHER			
At what level does he/she...			
1. Observe punctuality in starting and ending the class?	4.00	.000	Very Efficient
2. Explain the lesson in a clear and well-modulated voice?	4.00	.000	Very Efficient
3. Manifest enthusiasm and maintain a warm and friendly atmosphere conducive for learning?	4.00	.000	Very Efficient
4. Show confidence and mastery of the subject matter?	3.75	.500	Very Efficient
5. Exhibit fluency in the medium of instruction?	3.75	.500	Very Efficient
6. Give respectful remarks about the students' ideas and actions?	3.50	.577	Very Efficient
7. Implement consistently classroom management policies and maintain discipline and control?	2.75	.500	Somehow Efficient
8. Observe being well-organized and good management of the class time?	3.50	.577	Very Efficient
9. Make the learners attentive and observant of the classroom policies?	4.00	.000	Very Efficient
B. THE TEACHING PROCEDURE			
At what level does he/she...			
10. Present the lesson objectives and clear expectation of student performance?	4.00	.000	Very Efficient
11. Explain the purpose of a particular activity and its relationship with another part of the lesson?	3.50	.577	Very Efficient
12. Use effective questions and questioning techniques for stimulation of critical thinking?	3.50	.577	Very Efficient
13. Use a variety of instructional materials and learning resources for better understanding of the lessons and tasks?	2.75	.957	Somehow Efficient
14. Integrate the components of 21 st century skills in the learning activities?	2.75	.500	Somehow Efficient
15. Engage the learners in the discussion of the lesson through explanation of their ideas, giving of examples, sharing of experiences, asking of questions and clarification of concepts and praise them for their sharing and effort?	3.00	.000	Somehow Efficient
16. Maximize the time efficiently to make sure that essential concepts, tasks and application tasks are covered?	3.50	.577	Very Efficient
17. Provide opportunities for meaningful interaction and collaboration?	3.00	.816	Somehow Efficient
18. Pace the lesson according to the students' interest, understanding or performance?	2.75	.500	Somehow Efficient
19. Provide the students varied exercises for practice and give feedback regarding their answer?	3.25	.957	Somehow Efficient
20. Encourage learners or on their own, ask questions for clarification, for deepening their understanding of the standards and competencies?	2.50	.577	Somehow Efficient
21. Give formative tasks throughout the phases of the lesson to check on learners' attainment of the standards, competencies and objectives?	4.00	.000	Very Efficient
22. Use peaceful pedagogies in asking questions, motivating learners to share ideas, providing feedback and dealing with class behavior?	3.50	.577	Very Efficient
23. Require learners to use courteous expressions and to be respectful of others' ideas?	3.25	.500	Somehow Efficient
24. Integrate IGAs, or core values and/or other related values in the lessons and activities?	3.50	.577	Very Efficient
25. Enable learners to relate the new knowledge with their daily life or real-world situations?	3.25	.500	Somehow Efficient



26. Ensure that the lesson ends with important task reminders, a synthesis, summary or related closing activity?	4.00	.000	Very Efficient
Overall	3.433	0.417	Somehow Efficient

Legend: 3.50 – 4.00 Very Efficient, 2.50 – 3.49 Somehow Efficient, 1.50 – 2.49 Rarely Efficient, 1.00 – 1.49 Not Efficient

Table 3 presents the Teaching Environment Survey results after rating four teaching sessions of the teachers teaching the subject checking the implementation of the lesson plan. This further reveal that the lesson plan was somehow implemented with an overall mean of 3.433 which is interpreted as somehow efficient.

This further reveal that item numbers 1 “Observe punctuality in starting and ending the class”, 2 “Explain the lesson in a clear and well-modulated voice”, 3 “Manifest enthusiasm and maintain a warm and friendly atmosphere conducive for learning” 9 “Make the learners attentive and observant of the classroom policies”, 10 “Present the lesson objectives and clear expectation of student performance”, 21 “Give formative tasks throughout the phases of the lesson to check on learners’ attainment of the standards, competencies and objectives” , and 26 “Ensure that the lesson ends with important task reminders, a synthesis, summary or related closing activity” got the highest rated mean of 4.00 which is interpreted as very efficient.

On the other hand, item number 20 “Encourage learners or on their own, ask questions for clarification, for deepening their understanding of the standards and competencies” got the lowest rated mean of 2.50 which is interpreted as somehow efficient.

The results above showed that teachers were able to start and end the class on time explaining the lessons in a clear and well-modulated voice manifesting enthusiasm maintaining a warm and friendly atmosphere conducive for learning making the learners attentive and observant of the classroom policies. Moreover, the teachers were able to present the lesson objectives and clear expectation of student performance, give formative tasks throughout the phases of the lesson to check on learners’ attainment of the standards, competencies and objectives, and ensure that the lesson ends with important task reminders, a synthesis, summary or related closing activity. However, the teachers should encourage learners or on their own, ask questions for clarification, for deepening their understanding of the standards and competencies explain the lessons, provide students exercise practices, and require students to use courteous expressions however they need to explain the purpose of the activities and its relationship with other parts of the lessons.

D. Outcome

Table 4 presents the result of the created and implemented lesson plan through the students’ quarter exam raw scores. This also reflects the OSAT-A (pre-test) which serves as basis of their preliminary learning and the Quarter Exam Score (post-test)

Table 4: Students’ Scores

Classification	IQ Equivalent	OSAT – A Raw Score	OSAT-A		Quarter Exam Raw Score	Exam Score	
			Frequency	Percentage		Frequency	Percentage
Dull Normal	78 – 79	1 – 2	1	0.1	0 – 1	0	0.0
Below Average	80 – 89	3 – 12	158	22.0	2 – 8	4	0.8
Average	90 – 109	13 – 32	485	66.0	9 – 21	229	45.5
Above Average	110 – 119	33 – 42	70	10.0	22 – 28	168	33.4
Bright	120 – 129	43 – 52	17	2.0	29 – 34	68	13.5
Superior	130 – 139	53 – 62	3	0.4	35 – 41	24	4.8
Very Superior	140 – 149	63 – 72	0	0.0	42 – 48	9	1.8
Genius	150 – 152	73 - 75	0	0.0	49 – 50	1	0.2
Total			733	100.0		733	100.0



Table 4 presents the students' scores of the Grade 11 students. This further reveal that in the OSAT-A score, 485 or 66.0% has average IQ, 158 or 22.0% has a below average IQ, 70 or 10.0% has an above average IQ, 17 or 2.0% are bright, 3 or 0.4% are superior, 1 or 0.1% are dull normal, and 0 or 0.0% are very superior and genius. Moreover, in terms of quarter exam scores, 229 or 45.5% are average, 168 or 33.4% are above average, 69 or 13.5% are bright, 24 or 4.8% are superior, 9 or 1.8% are very superior, 4 or 0.8% are below average, 1 or 0.2% are genius, and 0 or 0.0% are dull normal.

Comparing the results of the two exam scores where the OSAT-A score is the pre-test score and the quarter exam score is the post – test score, it can be seen that most of the students are still in the average level. However, the data also showed that there is an improvement in the students for there is already 1 student who belonged to the genius category and from 1 in the OSAT-A score, in the quarter exam, none of the students is in the dull normal category.

CONCLUSION

Based on the results of the study, it is concluded that the evaluation of the antecedent component, namely the planning of the learning plan for General Mathematics, is somehow evident as evidenced by the lesson plans for the first quarter. The evaluation of the transaction component, namely the implementation of the learning process was somehow efficient as evidenced by the Teacher's Efficiency Scale results. Finally, the results of the evaluation on the outcome component showed that most of the students are still in the average level noting also that as majority of the students before belong to the lower half of the classification (dull normal to below average), now, majority of the students are in the higher half of the classification (above average to genius).

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