

# The Efficacy of an Integrative Performance Output in Senior High Subjects among STEM Learners

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## ABSTRACT

*In compliance to DepEd Order No. 12, s. 2020, teachers are compelled to collaboratively design and implement performance tasks that integrate two or more competencies within or across subject areas called “**Integrative Performance Output**”. Correlational research method was used in order to determine the significant relationship of the performances of the learners among subjects utilizing integrative performance task/output.*

*Research Paper was used as Integrative performance output for three integrated subjects. Teachers in the three (3) integrated subjects examined and combined their respective learning competencies to create an integrate performance output. Learners submitted their full research paper to their Practical research and Reading and writing teachers to assessed the overall content of the output while Chapter 4 was checked by the Statistics and Probability teacher.*

*Using F-test value of 4.81 the claim was rejected and concluded that there is a significant difference among the students’ performances in three (3) subjects; Practical Research 1, Statistics and Probability and Reading and Writing using an integrative performance task.*

*Likewise, using Pearson’s r of 0.89 and 0.82, it can be deduced that there is a high correlation between the students’ performance in Practical Research 1 and Reading and Writing and Statistics and Probability, respectively through the use of Integrative Performance Task/Output.*

*This implies that the utilization of an integrative performance output helped the students to improve their academic performance by making connections among concepts and experience so that information and skills can be applied to novel and complex challenges.*

## INTRODUCTION.

The Department of Education issued DepEd Order No. 31 s. 2020 “Interim Guidelines for Assessment and Grading in Light of the Basic Education Learning Continuity Plan,” summative assessment shall continue in the form of written works and performance tasks. Basically, learners are expected to do four (4) performance tasks per quarter per subject area. However, because of the implications brought about by the Online/Modular Distance Learning Modality that the Schools Division of Mandaluyong is currently implementing, learners are having difficulty in complying with this requirement. Hence, teachers ensure Academic ease in assessing student learning through an Integrative Performance Output.

Integrative Performance Output involves a series of integrated learning competencies from a variety of subjects applied to a variety of tasks. It can be as simple as breaking down an assignment into stages or having a group of related summative tasks that work together to increase capacity for additional learning and strengthen judgment abilities. The process begins with the three communicative modes as a reference point, and then moves to the selection of a theme followed by the creation of tasks around that theme, which corresponds to the three modes [5].

Teachers collaboratively design and implement performance tasks that integrate two or more competencies within or across subject areas. Observed that “complex learning is invariably slow learning, taking longer to grow than most modules last” [4]. Integrative assessment has the ability to lower the volume and stakes of summative assessments sooner in the learning process. This creates opportunities for students to learn from mistakes, to develop skills and understanding over time, and to generate dialogue between students and teachers about learning progress.

Several learning competencies in three (3) senior high subjects were combined namely, Statistics and Probability, Reading and Writing, and Practical Research 1. The mastery level of these combined learning competencies is deliberately assessed through a “Research Paper”. Research paper is the integrative performance output utilized for this study which covers different content standards and performance standards in three integrated learning areas. The study aims to determine the efficacy of using integrative performance output to improve learners’ academic performances in the three integrated subjects and help them overcome the burden of accomplishing different tasks in this Pandemic.

## **STATEMENT OF THE PROBLEM.**

The study aims to determine the efficacy of an Integrative Performance Output in the academic performances of the STEM learners in three (3) SHS subjects. Specifically, it sought to answer the following questions;

1. What is the performance level of the learners in terms of their performance task in the three (3) combined subjects through the Integrative Performance Output?
2. Is there a significant difference among the performance of the learners in the combined subjects using an integrative performance output?
3. What is the significant relationship between the performance of the learners in Practical research 1 and Reading and Writing?
4. What is the significant relationship between the performance of the learners in Practical research 1 and Statistics and Probability?
5. What continuous improvement program can be recommended in order to sustain the efficacy of the study?

## **RESEARCH METHODOLOGY.**

The researcher used a Quantitative research design which is an approach used to determine the level of performance of the learners after accomplishing the Integrative Performance Output of the three (3) subjects; Statistics and Probability, Reading and Writing and Practical Research 1. Correlational research method was used in order to determine the significant relationship of the performances of the learners among subjects utilizing integrative performance task/output.

The respondents for the study were chosen using the purposeful sampling technique, which is a non-probability sampling technique. The study included thirty-four (34) STEM students enrolled in the same topics for the School Year 2020-2021. They were picked from among other STEM sections because they had the lowest mean percentage grade in the third quarter. Subject teachers in the three (3) integrated disciplines evaluated the potential of merging their different learning competencies to create an integrated performance output as illustrated in figure 1.

**Figure 1**  
**Integrative Learning Competencies of Three (3) Senior High School Subjects**

SHS SUBJECT	LEARNING COMPETENCIES	INTEGRATIVE PERFORMANCE OUTPUT
Practical Research 1	1. designs a research project related to daily life	RESEARCH PAPER
	2. selects relevant literature	
	3. synthesizes information from relevant literature	
	4. writes coherent review of literature	
	5. presents written review of literature	
	6. describes sampling procedure and sample	
Reading and Writing	1. Explains critical reading as looking for ways of thinking	RESEARCH PAPER
	2. Identifies claims explicitly or implicitly made in a written text a. Claim of fact, b. Claim of policy, and c. Claim of value	
	3. Formulates evaluative statements about a text read a. Formulates assertions about the content and properties of a text read, and b. Formulates meaningful counterclaims in response to claims made in a text read	
	4. Identifies the unique features of and requirements in composing texts that are useful across disciplines a. Book Review or Article Critique, b. Literature Review, c. Research Report, d. Project Proposal, and e. Position Paper	
	5. Identifies properties of a well-written text a. organization, b. coherence and cohesion, c. language use, and d. mechanics	
Statistics and Probability	1. distinguishes between parameter and statistic	RESEARCH PAPER
	2. identifies sampling distributions of statistics (sample mean).	

In examining the connections in curriculum, the evidence suggests that integrated assessment approaches are likely to improve the overall student experience by presenting curriculum as an integrated, holistic opportunity for students to engage with the overarching aims and intention of the programme. [3].

Research Paper was the Integrative performance output used for this study. Learners submitted their full research paper to practical research and reading and writing teachers. While, Chapter 4 of their research paper was submitted to their statistics and probability teacher. The Teachers in Practical research and Reading and Writing used rubrics in assessing the research paper of the learners based on their learning competencies and the statistics and probability teacher checked the statistical treatment of data used by the learners.

The scores of the students were recorded and tabulated to determine the level of performance of each learner in the three (3) subjects. Pearson Product-Moment correlation was used to determine the significant relationship between the performances of the learners in Practical Research 1 versus Reading and Writing and Practical Research 1 versus Statistics and Probability through an Integrative Performance Output. Likewise, F-test was used to determine the significant difference among three (3) subjects utilizing an integrative performance output.

## RESULTS AND FINDINGS.

### 1. Performance Level of the learners in the three (3) combined subjects using the Integrative Performance Output

Table 1 illustrates the performance of students in the performance task through the integrative performance task/output utilize by the three (3) subjects.

**Table 1**  
**Performance Level of the Learners in the Three (3) Subjects through Integrative Performance Task/Output**

Performance Task	Statistics & Probability		Reading & Writing		Practical Research 1	
	f	%	f	%	f	%
Outstanding (90-100)	18	52.94	27	79.41	26	76.47
Very Satisfactory (85-89)	16	47.06	7	20.59	8	23.53
Satisfactory (80-84)	0	0	0	0	0	0
Fairly Satisfactory (75-79)	0	0	0	0	0	0
Did Not Meet Expectation (Below 74)	0	0	0	0	0	0
<b>TOTAL</b>	<b>34</b>	<b>100</b>	<b>34</b>	<b>100</b>	<b>34</b>	<b>100</b>
<b>OVERALL MEAN GRADE</b>	<b>91 OUTSTANDING</b>		<b>92 OUTSTANDING</b>		<b>93 OUTSTANDING</b>	

Data showed that most of the learners performed “Outstanding” in the Integrative Performance Output in all the combined three (3) subjects. 18 or 52.94% performed “Outstanding” in Statistics and Probability, 27 or 79.41% of the learners in Reading and Writing performed “Outstanding” and 26 or 76.47% of learners performed “Outstanding” through an Integrative Performance Output (Research Paper).

Data showed that through an integrative performance output helped students in maintaining an excellent academic performance in the three subjects with the computed overall mean of 91% for Statistics and Probability, 92% for Reading and Writing and 93% for Practical Research 1.

This implies that using an integrative approach in assessing the students' performance greatly helped improve the overall student experience by presenting curriculum as an integrated, holistic opportunity for students to engage with the overarching aims and intention of the program. [3]

## 2. Difference in the Performance Level of the learners in the three (3) subjects using the Integrative Performance Output

Table 2 indicates the significant difference in the performance level of the learners on the three (3) subjects utilizing Integrative Performance Output.

**Table 2**  
**Difference in the Performance Level of the Learners in the Three (3) Subjects Using the Integrative Performance Output**

Performance Output	Mean	F-Value		Remarks	Decision
		Computed	Tabular		
Practical Research 1	93	4.81	3.702	Reject	Significant
Statistics & Probability	91				
Reading & Writing	92				

Based on the results of Analysis of Variance (F-test), the computed value of 4.81 is greater than the tabular value of 3.702 using 0.05 level of significance, the claim was rejected and concluded that there is a significant difference among the students' performance in three (3) subjects; Practical Research 1, Statistics and Probability and Reading and Writing using an integrative performance task.

Data implies that an integrative performance task of two or more subjects affects the students' performance based on an integration of knowledge within and across learning areas, the provision of new information and a requirement to explain issues using a combination of knowledge from the learning competencies of the integrated subjects [1].

## 3. Relationship between the performance of the learners in Practical research 1 and Reading and Writing using the Integrative Performance Output.

Table 3 indicates the relationship between the performance of the learners in Practical research 1 and Reading and Writing using the Integrative Performance Output.

**Table 3**  
**Significant Relationship Between the Performance of the Learners in Practical Research 1 and Reading and Writing using the Integrative Performance Output.**

Research Output	Mean	Pearson's r	Correlation	t-statistics		Remarks	Decision
				Comp	Tabular		
Practical Research 1	93	0.89	High Correlation	11.04	0.339	Reject	Significant
Reading & Writing	92						

Based on the results of Pearson's  $r$  of 0.89, it can be deduced that there is a high correlation between the students' performance in Practical Research 1 and Reading and Writing through the use of Integrative Performance Task/Output. Furthermore, since the computed t-statistics of 11.04 is greater than the tabular value of 0.339 using 0.05 level of significance, the claim was rejected and concludes that there is a significant relationship between the students' performance in Practical Research 1 and Reading and Writing using an integrative performance task.

Data implies that the utilization of an integrative assessment affects the students' performance since similar learning competencies were integrated in these two subjects. Thus, students applied their knowledge in Reading and Writing subject in terms of technical and academic writing towards their research paper.

#### **4. Significant relationship between the performance of the learners in Practical research 1 and Statistics and Probability using the Integrative Performance Output.**

Table 4 indicates the relationship between the performance of the learners in Practical research 1 and Statistics and Probability using the Integrative Performance Output.

**Table 4**  
**Significant Relationship Between the Performance of the Learners in Practical Research 1 and Statistics and Probability using the Integrative Performance Output.**

Research Output	Mean	Pearson's r	Correlation	t-statistics		Remarks	Decision
				Comp	Tabular		
Practical Research 1	93	0.82	High Correlation	8.10	0.339	Reject	Significant
Statistics & Probability	91						

Based on the results of Pearson's  $r$  of 0.82, it can be deduced that there is a high correlation between the students' performance in Practical Research 1 and Statistics and Probability through the use of Integrative Performance Task/Output. Furthermore, since the computed t-statistics of

8.10 is greater than the tabular value of 0.339 using 0.05 level of significance, the claim was rejected and concludes that there is a significant relationship between the students' performance in Practical Research 1 and Statistics and Probability using an integrative performance task.

Data implies that the utilization of an integrative assessment affects the students' performance in terms of Chapter 4. It shows that the students were presented and computed statistical treatment of data for their Research paper using their knowledge in Statistics and Probability.

## **DISCUSSION.**

This paper demonstrated that when performance task of two or more subjects or learning areas were combined, it helped to improve overall student performance among the combined subjects. There integration is when students were able to connect what they are learning in one subject area to related content in another subject area. John Dewey claimed that learning could be more meaningful if content areas are blended for curriculum and instruction. The use of unifying themes and real-life activities could lead to more relevant learning. The quality of learning outcomes is able to integrate information across disciplines instead of acquiring them in isolation.

The study showed a significant relationship of performance of the learners in two combined subjects. In the subject Reading and Writing, learners were taught of formulating evaluative statements about a text they read, formulating assertions about the content and properties of a text read and literature review. These learnings were incorporated and used by the learners in writing their review of related literature in the subject Practical Research 2. Likewise, in Practical Research 2, students were taught how to write chapters 1 to 5 of their research which the knowledge they got from Reading and Writing could be applied like identifying properties of a well-written text in terms of organization, coherence and cohesion, language use, and mechanics.

The integrated approach of a performance task is a vehicle that allows teachers to design lessons and activities that meet practical knowledge for the students. In addition, with this study, it is clear that integrative learning brought by an integrative performance task is important to prepare students to deal effectively both with the complexity of every learning area and the challenges facing the broader society today and in the future.

## **CONCLUSIONS.**

In this paper, through providing curriculum as an integrated, holistic chance for students to connect with the goals and intention of easing up student tasks, an integrative approach to evaluate students' performance dramatically improved the overall student experience. The students' performance is influenced by the integrative performance output of two or more subjects, which

includes the integration of knowledge within and across learning areas, the creation of new products, and the requirement to explain issues using a combination of knowledge from the integrated subjects' learning competencies. The use of an integrative output is important in assisting students in applying their knowledge from the Reading and Writing subject in terms of technical and academic writing to their research paper in the Practical Research subject. Likewise, by applying their knowledge in Statistics and Probability, students were able to improve their performance in Chapter 4 in terms of presenting and computing statistical treatment of data.

Hence, in this pandemic, the integrative performance output contributed to the learners' academic performances in the three integrated disciplines and assisted them in overcoming the pressure of completing many activities.

## **Research Output**

### **Integrative Strategic Testing and Reporting – (Project iSTAR)**

#### **Background and Rationale:**

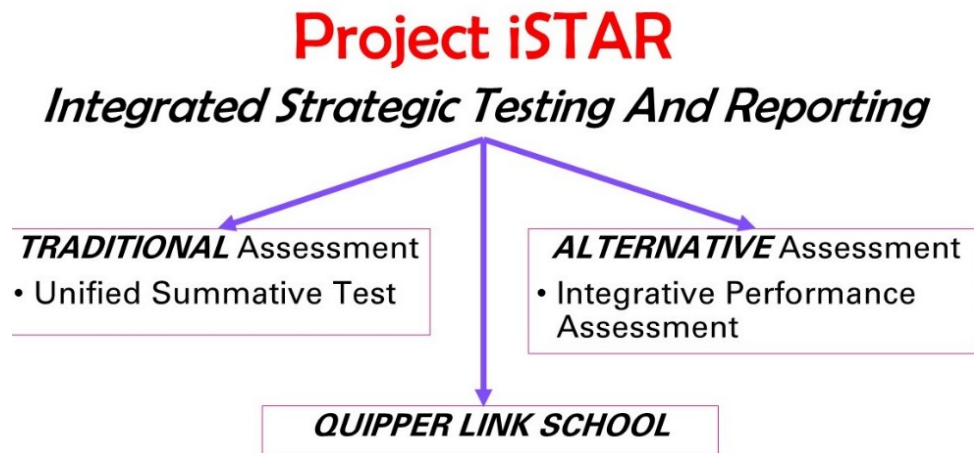
Through DO 12, s. 2012, assessment should be holistic and authentic in capturing the attainment of the most essential learning competencies. Assessment is integral for understanding student learning and development at the same time variations of assessment strategies is necessary, with formative assessment taking priority to inform teaching and promote growth and mastery.

Teachers need to be creative and flexible in assessing student learning, while still adhering to the principles of quality assessment practice. With safety, health, and well-being foremost in mind, assessment decisions must be made in the best interest of all learners, ensuring that all assessment activities align with the most essential learning competencies, should be reliable, valid and transparent. Assessment activities are fair, inclusive, equitable, practical and manageable for both learners and teachers. These assessment tasks should give learners arrange of ways to demonstrate their learning and provide timely and accurate information as basis for feedback.

In compliance to this DepEd Order, the MPNAG SHS teachers introduce an Integrated Strategic Testing and Reporting for Mathematics and Research subjects or Project iSTAR.



## Project iSTAR Framework



### Objectives.

This project iSTAR aims to:

1. Develop a unified objective assessment (summative test) for SHS Mathematics and Research subjects.
2. Encourage teachers to develop an integrative performance task activity for students in Statistics and Probability, Practical Research 1, III and all other subjects that have something in common.
3. Provide scholarly reports on students' assessment in a form of quarterly summative test.
4. Use the summative test report for students' intervention and teacher's pedagogical improvement.

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