VALIDATION AND UTILIZATION OF INTEGRATIVE LEARNING ASSESSMENT AS AN AUTHENTIC ASSESSMENT TOOL IN TEACHING SCIENCE

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Abstract

Integrative learning assessment is a type of assessment that aims to combine students' learning from multiple subjects/disciplines into a single assessment. This study determined the level of validation and utilization of integrative assessment material as an authentic assessment tool in teaching Science. This was a quantitative research that utilized the Independent and Dependent (IV-DV) variables model. The data gathered were analyzed and treated using weighted mean and Pearson product-moment correlation. This study was conducted during the third quarter of the S.Y 2021-2022 to 60 Science teachers and experts and 80 students from the City Schools Division of Cabuyao. The teachers and experts answered a survey questionnaire on the validation and evaluation of the integrative assessment materials in Biology. The other group of respondents which are the students utilized the said materials by performing the tasks and activities which were rated by the teacher. They also answered a questionnaire to determine their perceptions toward the integrative assessment materials.

Findings showed that the integrative assessment materials that were validated by the teachers and experts got a "Very High" level of validation, which means that these materials can be used as authentic assessment tool in teaching Science. On the other hand, the students' level of perception also got" Very High" towards the integrative assessment materials which means that they perceived and find the materials very good and helpful in measuring their learnings. In relation to this, upon the utilization of these materials, the students achieved an "Outstanding" level in their scores in terms of the performance tasks. However, there was no significant relationship between the level of perception of students and their performance scores. It was concluded that there were other factors attributed to their perceptions toward the materials and to their performance scores. Results from this study provide recommendations for future research.

Keywords: authetic assessment, integrative learning assessment, integrative assessment material

1. INTRODUCTION

The COVID-19 pandemic has changed the world. It brought extraordinary challenges, especially to basic education. Schools, both public and private have to adjust to the new situation where face-to-face classes and some school-related gatherings are prohibited. Despite these happenings, sustaining and providing quality education should be taken into consideration in terms of planning and implementing new normal policies. Because of this, everyone from the administrators, teachers, and other non-teaching personnel adjusted to work from the home scheme, and the revision of the curriculum and other requirements is shifted to alternative or distance teaching and learning modalities such as online, modular, and blended learning. Aside from these alternative working and learning arrangements, the assessment procedures have changed also. With this, to ensure that learners will still achieve the essential curricular goals, the Department of Education issued the DepEd Order 31, series of 2020 (DO 31, s. 2020) which is the Interim Policy Guidelines for Assessment and Grading in Light of the Basic Education Learning Continuity Plan. This is to help implement effective assessment despite the pandemic and provide guidance in the assessment of student learning and on the grading scheme. Thus, it will provide the most meaningful support to the learners' development and will respond to varied contexts at this time.

In line with it, classroom assessment is a crucial factor in curriculum implementation right now. It allows the teachers to monitor and measure the student's progress while adjusting to the way of teaching and instruction accordingly. As stated in DepEd Order (DO) No. 8, s. 2015, the Policy Guidelines in Classroom Assessment for the K to 12 Basic Education Program, assessment should be used to inform and improve classroom practices and promote learning outcomes. However, in distance or blended learning environments, it is necessary to utilize alternative tools and strategies for assessing and supporting learning, especially in teaching Science, where the Program for International Student Assessment (PISA) results revealed that the Philippines scored 357 in Science which is below the average of participating Organization for Economic Cooperation and Development (OECD) countries last 2019. Because of this, teachers really need to provide appropriate assessments if

they want to improve and develop learners' higher-order thinking and 21st-century skills. They need to think of multiple ways of achieving the goal of providing authentic assessments.

Moreover, in the K-12 educational contexts, authentic assessment is an effective measure of intellectual achievement or ability because it requires students to demonstrate their deep understanding, higher-order thinking, and complex problem solving through the performance of exemplary tasks. Hence, authentic assessment can serve as a powerful tool for assessing students' 21st-century competencies in the context of global educational reforms. To enable the power of authentic assessment to unfold in the classrooms of the 21st century, it is essential that teachers are not assessment literate but also competent in designing and using authentic assessments to support student learning and mastery of the 21st-century competencies. On the other hand, learners of today should not only know the basic skills in reading and arithmetic but also the skills that will allow them to face the world that is continually changing. They must know how to think critically, analyze problems and situations and draw conclusions and inferences. This only means that they also needed skills that require them to acquire new learning goals. That is why teachers also play a significant role in designing assessments that will promote authentic learning outcomes.

Hence, one way of achieving the authenticity of learning is to have an integrative learning assessment that can be used as a tool in teaching Science. It can be an effective way to develop an assessment material wherein the integration of learnings across other disciplines should reflect on it. Thus, it will strengthen their knowledge and skills to be lifelong learners despite the kind of learning situation they are in. In support of this, leaders in the movements of the K-12 standards also advocate integrative learning. They said that the "connections" as one of its standards, suggesting that instructional programs should enable students to understand ideas and interconnect and build on one another to produce a coherent whole and recognize and apply these subjects in contexts outside the field.

1.1 Objectives of the Study

This study aims to develop and determine the level of validation and utilization of integrative learning assessment materials in teaching Science Grade 9 in the City Schools Division of Cabuyao for the S.Y 2021-2022 in the study of Biology.

Specifically, this study seeks to answer the following:

1. What is the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts in terms of:
    1.1. Structure and Logistics
    1.2. Intellectual Designs
    1.3. Grading and Scoring
    1.4. Fairness?

2. What is the level of students' performance in terms of:
    2.1. Integrative Assessment Material 1 (Health is Wealth!)
    2.2. Integrative Assessment Material 2 (Adapt Me!)
    2.3. Integrative Assessment Material 3 (Mystery Cases, Solved!)
    2.4. Integrative Assessment Material 4 (Treasure Hunt)
    2.5. Integrative Assessment Material 5 (Bubbling Plants)?

3. What is the students' level of perception towards the integrative assessment material in terms of:
    3.1. ease of use
    3.2. creativity
    3.3. complexity
    3.4. action-centered?

4. Is there a significant relationship between the level of students' performance in terms of the integrative assessment materials and the students' perception towards these materials?

2. METHODOLOGY

2.1 Research Design

The study was quantitative research. This emphasized objective measurement and the statistical, mathematical, or numerical analysis of data collected through questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques. Quantitative research focuses on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon. (Creswell, 2013)

This research employed three data sources. The first was the performance output results from the students using the integrative assessment material which was described as quantitative. The second data source was the data that came from the questionnaires that was administered to students, teachers and experts. Lastly, the third data source came from the structured

interview and follow-up interview. Using Triangulation in research which refers to the use of multiple techniques for gathering and/or handling data within a single study. This allowed the researcher to compare and combine the data to come up with a theme regarding the use of integrative assessment in the teaching and learning cycle. This method also allowed the researcher to confirm the apparent findings. This study reviewed the arguments surrounding the use of triangulation and shows how its use facilitated one researcher's attempt to provide a complete picture of the use of integrative assessment.

2.2 Respondents of the Study

The study involved Science teachers and experts and Grade 9 students in the City Schools Division of Cabuyao in the school year 2021-2022. Two groups of respondents were involved in the study, they are 80 grade 9 students and 60 public school science teachers and experts.

2.3 Research Instrument

The questionnaires were the foremost tool in the gathering of data designed according to the specific problems of the study. In this study, the questionnaires used were assured to be free of biases may in terms of gender, class, ethnicity or culture. The instruments were validated by experts. A letter requesting the assistance of the experts in education to validate the instruments was made. Also, a tool for validation was also provided. The summary of comments of the experts who validated the instruments in all variables were consolidated and made changes in the actual instrument.

The survey instrument was used to collect data from the teacher and experts, it consisted of 5 sections: the first section described the demographic characteristics of the respondents. The second part described the level of validation and utilization of the assessment material based on structure and logistics of the assessment tool. The third part described the level of validation and utilization of the assessment material based on intellectual design feature. The fourth part described the level of validation and utilization of the assessment material based on grading and scoring characteristics of the tool. Lastly, the fifth part described the level of validation and utilization of the assessment tool based on fairness. And for the students, the survey questions were comprised of five Likert-type questions that would determine their perception towards the integrative assessment materials.

2.4 Statistical Treatment

The following was used to describe the level of validation and utilization of the integrative assessment materials and the level of students' perception and was also used to interpret the results of the respondents on the level of practice.

Legend:

Range	Verbal Description	Interpretation
4.5-5.00	Strongly Agree	Very high
3.5-4.49	Agree	High
2.5-3.49	Neuter	Moderate
1.50-2.49	Disagree	Low
1.00-1.49	Strongly Disagree	Very Low

The following was used to describe the level of students' performance in terms of the five integrative assessment materials and was also used to interpret the results of the respondents on the level of practice.

Legend:

Range	Verbal Interpretation
4.20-5.00	Outstanding
3.40-4.19	Very Satisfactory
2.60-3.39	Satisfactory
1.80-2.59	Fair
1.00-1.79	Needs Improvement

To ensure the reliability of assessment and interpretation of data, the following statistical treatments were utilized: 1.Weighted Mean. This was employed in determining the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts, also, in determining the mean performance of students in terms of the performance task scores from the utilization of integrative assessment materials and the mean score of perception of students toward the integrative assessment materials. Computerized data processing was employed in this kind of data.

Obtained weighted mean in level of validation and utilization of the integrative assessment materials rated by Science teachers and experts and the perception of students toward these materials were interpreted based on the following range:

Scale	Range	Verbal Interpretation
4.5-5.00	Strongly Agree	Very high
3.5-4.49	Agree	High
2.5-3.49	Neuter	Moderate
1.50-2.49	Disagree	Low
1.00-1.49	Strongly Disagree	Very Low

Obtained weighted mean in students' performance in utilizing the integrative assessment materials in terms of the performance tasks was interpreted based on the following range:

Range	Verbal Interpretation
45.0-50.0	Outstanding
35.0-44.9	Very Satisfactory
25.0-34.9	Satisfactory
15.5-24.9	Unsatisfactory
10.0-14.9	Poor

2. Pearson product-moment correlation is the most widely used computational formula for correlation or to describe the relationship between variables. In this study, the relationship between the students' mean performance in terms of the performance tasks and the students' perception towards the integrative assessment materials was examined.

2. RESULTS AND DISCUSSION

This section comprises the presentation, analysis and interpretation of the findings from this study. The analysis and interpretation of data is carried out based on the results of the survey questionnaires given to teachers, experts and students as well as the results of the performance scores of students which both deals with the quantitative analysis of data.

Table 1 illustrates the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts in terms of structure and logistics. Among the statements above, "helps students understand the specific knowledge and skills they must demonstrate to reach or exceed proficiency" and "promotes reflection and growth to provide specific, actionable feedback leading to increased student ownership and deeper levels of understanding" yielded the highest mean score *(M=4.80, SD=0.44)* and was remarked as Strongly Agree. This is followed by "assesses students' ability to efficiently and effectively use their prior knowledge and skills to do a complex task" with a mean score *(M=4.75, SD=0.51)* and was also remarked as Strongly Agree. On the other hand, the statement "demands judgment to determine what information or skills are relevant and how they should be used" received the lowest mean score of responses with *(M=4.63, SD=0.55)* yet was also remarked Strongly Agree.

Overall, the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts in terms of structure and logistics attained a mean score of 4.73 and a standard deviation of 0.49 and was Very High among the respondents.

Table 1. Level of Validation and Utilization of Integrative Assessment Material as an Authentic Assessment Tool as Rated by Teachers and Experts in terms of Structure and Logistics

THE ASSESSMENT MATERIAL	MEAN	SD	REMARKS
1. involves some collaboration with others which includes access to teachers, tech support, or working with a partner for all or some parts of the task.	4.73	0.48	Strongly Agree
2. has clear instructions and clearly breakdowns the task or questions to be answered.	4.73	0.48	Strongly Agree
3. exhibits integration of topics to other subjects or disciplines.	4.73	0.52	Strongly Agree
4. measures the mastery of a certain skill or more than 1 skill	4.73	0.52	Strongly Agree
5. gives feedback to keep students "on target" for achievement	4.73	0.48	Strongly Agree
6. reflects to the needs and interests of the learners.	4.73	0.48	Strongly Agree
7. assesses students' ability to efficiently and effectively use their prior knowledge and skills to do a complex task.	4.75	0.51	Strongly Agree
8. requires application of what students have learned to a new situation.	4.70	0.50	Strongly Agree
9. demands judgment to determine what information or skills are relevant and how they should be used.	4.63	0.55	Strongly Agree
10. is appropriately public which can involve real-world audience or other stakeholders and clients to do the task.	4.72	0.49	Strongly Agree
11. is not only "one shot" which gives students a chance to show and use particular knowledge and skills in several different ways or contexts.	4.68	0.50	Strongly Agree
12. requires a high-quality product or performance, and just a justification of the solutions to problems encountered while doing the task.	4.73	0.52	Strongly Agree
13. promotes consistency and clarity of expectations as well as the transfer of skills across topics and content areas.	4.73	0.52	Strongly Agree
14. helps students understand the specific knowledge and skills they must demonstrate to reach or exceed proficiency.	4.80	0.44	Strongly Agree
15. promotes reflection and growth to provide specific, actionable feedback leading to increased student ownership and deeper levels of understanding.	4.80	0.44	Strongly Agree
Overall Mean = 4.73 **Standard Deviation = 0.49** **Verbal Interpretation = Very High**			

Table 2 illustrates the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts in terms of intellectual designs. Among the statements above, “builds knowledge and skills over time wherein students can progress from beginner to advance levels” and “involves essential and challenging tasks, questions or problems” yielded the highest mean score *(M=4.83, SD=0.38)* and were remarked as Strongly Agree. This is followed by “is engaging, educational and ensures that students will take responsibility in doing the task” and “is comprehensible and demonstrates direct and understandable directions and instructions on how to do the task” with a mean score *(M=4.82, SD=0.39)* and were also remarked as Strongly Agree. On the other hand, the statements “is contextualized and complex and not disintegrated to isolated objectives” and “has a lot of depth, wisdom and is worth spending time” received the lowest mean score of responses with *(M=4.70, SD=0.50)* yet were also remarked Strongly Agree.

Overall, the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts in terms of intellectual designs attained a mean score of 4.76 and a standard deviation of 0.45 and was Very High among the respondents.

Table 2. Level of Validation and Utilization of Integrative Assessment Material as an Authentic Assessment Tool as Rated by Teachers and Experts in terms of Intellectual Designs

THE ASSESSMENT MATERIAL	MEAN	SD	REMARKS
1. is enabling and pointing the students toward more sophisticated and important use of skills and knowledge.	4.73	0.45	Strongly Agree
2. builds knowledge and skills over time wherein students can progress from beginner to advance levels.	4.83	0.38	Strongly Agree
3. is contextualized and complex and not disintegrated to isolated objectives	4.70	0.50	Strongly Agree
4. requires students to make or do own research to complete the task.	4.75	0.47	Strongly Agree
5. evaluates students' habits and performance and not merely focus on recall and knowledge-based questions.	4.73	0.52	Strongly Agree
6. is engaging, educational and ensures that students will take responsibility in doing the task.	4.82	0.39	Strongly Agree
7. involves essential and challenging tasks, questions or problems.	4.83	0.38	Strongly Agree
8. is comprehensible and demonstrates direct and understandable directions and instructions on how to do the task.	4.82	0.39	Strongly Agree
9. is tied to real-world contexts and requires the students to do the task.	4.77	0.43	Strongly Agree
10. is multi-faceted and shows integrated challenges in which a range of skills and knowledge must be used in coordination.	4.77	0.43	Strongly Agree
11. has a lot of depth, wisdom and is worth spending time.	4.70	0.50	Strongly Agree
12. is versatile/flexible and can be used by other teachers also.	4.75	0.47	Strongly Agree
13. allows appropriate opportunities to rehearse, practice, consult resources and get feedback on and refine performances and products.	4.73	0.52	Strongly Agree
14. supports the design of assessments aligned with the most essential competencies of the integrated subjects.	4.77	0.46	Strongly Agree
Overall Mean = 4.76 **Standard Deviation = 0.45** **Verbal Interpretation = Very High**			

Table 3 illustrates the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts in terms of grading and scoring. Among the statements above, "evaluates essentials and meaningful tasks and not just merely what it easily scores" *(M=4.82, SD=0.39),* "provides a clear, transparent and detailed rubric to mark and evaluate students' outputs and performance" *(M=4.82, SD=0.39),* "focuses on evaluating the abilities, processes and products of learning" *(M=4.82, SD=0.43),* and "uses rubrics for a range of specific assessment tasks" *(M=4.82, SD=0.39)* yielded the highest mean score and were remarked as Strongly Agree. On the other hand, the statement "involves complex tasks which there may be no right answer and that may not be easily scored" received the lowest mean score of responses with *(M=4.63, SD=0.52)* yet were also remarked Strongly Agree.

Overall, the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts in terms of grading and scoring attained a mean score of 4.76 and a standard deviation of 0.44 and was Very High among the respondents.

Table 3. Level of Validation and Utilization of Integrative Assessment Material as an Authentic Assessment Tool as Rated by Teachers and Experts in terms of Grading and Scoring

THE ASSESSMENT MATERIAL	MEAN	SD	REMARKS
1. evaluates essentials and meaningful tasks and not just merely what it easily scores.	4.82	0.39	Strongly Agree
2. provides a clear, transparent and detailed rubric to mark and evaluate students' outputs and performance.	4.82	0.39	Strongly Agree
3. focuses on evaluating the abilities, processes and products of learning.	4.82	0.43	Strongly Agree
4. includes self-assessment as part of the assessment to help them take responsibility for their grades and learning.	4.73	0.45	Strongly Agree
5. uses a multi-faceted analytic trait scoring system instead of one holistic grade/score.	4.80	0.40	Strongly Agree
6. exhibits harmony with shared school wide aims/standards and keeps in mind the learning outcomes in creating and developing assessments.	4.73	0.48	Strongly Agree
7. involves complex tasks which there may be no right answer and that may not be easily scored.	4.63	0.52	Strongly Agree
8. designs to improves students' performance and provides usable information that they can use for future reference.	4.73	0.45	Strongly Agree
9. provides scoring criteria that are task neutral which can be applied to a variety of learning experiences and products resulting to a clear progression of learning.	4.72	0.45	Strongly Agree
10. promotes consistency of scoring across teachers that improves the reliability of the assessment.	4.77	0.46	Strongly Agree
11. possesses to evaluate a wide range of possible tasks and establishes a clear definition of achievement of the essential skills and knowledge.	4.77	0.43	Strongly Agree
12. uses rubrics for a range of specific assessment tasks.	4.82	0.39	Strongly Agree
Overall Mean = 4.76			
Standard Deviation = 0.44			
Verbal Interpretation = Very High			

Table 4 illustrates the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts in terms of fairness. Among the statements above, "helps to unveil hidden strengths and skills of students" yielded the highest mean score *(M=4.78, SD=0.42)* and was remarked as Strongly Agree. This is followed by "can be attempted by all students in such a way where it has clear questions and tasks to guide the students" and "promotes equitable outcomes by meeting the needs of all types of students" with a mean score *(M=4.77, SD=0.43)* and were also remarked as Strongly Agree. On the other hand, the statements "standards for judgment is predictable and known in advance" *(M=4.65, SD=0.58)*, "validity is not sacrificed in favor of reliable scoring" *(M=4.65, SD=0.52)* and "minimizes needless, unfair and comparisons of students to one another" *(M=4.65, SD=0.48)* received the lowest mean score of responses yet were also remarked Strongly Agree.

Overall, the level of validation and utilization of integrative assessment material as an authentic assessment tool as rated by teachers and experts in terms of fairness attained a mean score of 4.71 and a standard deviation of 0.47 and was Very High among the respondents.

Table 4. Level of Validation and Utilization of Integrative Assessment Material as an Authentic Assessment Tool as Rated by Teachers and Experts in terms of Fairness

THE ASSESSMENT MATERIAL	MEAN	SD	REMARKS
1. helps to unveil hidden strengths and skills of students.	4.78	0.42	Strongly Agree
2. standards for judgment is predictable and known in advance.	4.65	0.58	Strongly Agree
3. validity is not sacrificed in favor of reliable scoring.	4.65	0.52	Strongly Agree
4. minimizes needless, unfair and comparisons of students to one another.	4.65	0.48	Strongly Agree
5. allows appropriate room for students' styles and interests with the use of some elements which makes it accessible to all types of students.	4.72	0.45	Strongly Agree
6. can be attempted by all students in such a way where it has clear questions and tasks to guide the students.	4.77	0.43	Strongly Agree
7. has perceived a meaningful value to the students being assessed.	4.75	0.44	Strongly Agree
8. evaluates against unintended bias which uses contexts that are equally familiar to all and uses words that have common meanings to all.	4.75	0.44	Strongly Agree
9. is crystal clear and it appears to assess what you want them to and it does not favor students of a particular background.	4.67	0.48	Strongly Agree
10. avoids stereotyping, not offensive and assess in ways it does not favor some students over others.	4.67	0.48	Strongly Agree
11. yields results or outcomes that are meaningful, appropriate and fair to all relevant subgroups of students.	4.75	0.47	Strongly Agree
12. promotes equitable outcomes by meeting the needs of all types of students.	4.77	0.43	Strongly Agree
Overall Mean = 4.71			
Standard Deviation = 0.47			
Verbal Interpretation = Very High			

Table 5 illustrates the level of performance of students towards integrative assessment material 1 (Health is Wealth!). All the categories above, "Articulation of the Issue", "Response to audience views and values" and "Tailoring the issue and campaign to the audience" yielded the same mean scores (M=5.00, SD=0.00) and were remarked as Outstanding.

Overall, the level of performance of students towards integrative assessment material 1 (Health is Wealth!) attained a mean score of 5.00 and was Outstanding among the respondents.

Table 5. Level of Students' Performance in terms of Integrative Assessment Material 1 (Health is Wealth!)

Category	Mean	SD	Descriptor
1. Articulation of the Issue	5.00	0.00	Outstanding
2. Response to audience views and values	5.00	0.00	Outstanding
3. Tailoring the issue and campaign to the audience	5.00	0.00	Outstanding
4. Tailoring the issue and campaign to the audience	5.00	0.00	Outstanding
5. Tailoring the issue and campaign to the audience	5.00	0.00	Outstanding
Grand Mean	**5.00**		**Outstanding**

Legend:

Scale	Range	Descriptor
5	4.20 – 5.00	Outstanding
4	3.40 – 4.19	Very Satisfactory
3	2.60 – 3.39	Satisfactory
2	1.80 – 2.59	Fair
1	1.00 – 1.79	Needs Improvement

Table 6 illustrates the level of performance of students towards integrative assessment material 2 (Adapt Me!). Among the categories above, "Styles and Techniques/Creativity (for paragraph)" yielded the highest mean score *(M=4.94, SD=0.24)* and was remarked as Outstanding. This is followed by "Appeal (for artwork)" with a mean score *(M=4.91, SD=0.28)* and was also remarked as Outstanding. On the other hand, the categories "Content Accuracy (for artwork)" and "Styles and Techniques/Creativity (for artwork)" *(M=4.70, SD=0.46)* received the lowest mean score of responses yet was also remarked Outstanding.

Overall, the level of performance of students towards integrative assessment material 2 (Adapt Me!) attained a mean score of 4.84 and was Outstanding among the respondents.

Table 6. Level of Students' Performance in terms of Integrative Assessment Material 2 (Adapt Me!)

Category	Mean	SD	Descriptor
1. Content Accuracy (for artwork)	4.70	0.46	Outstanding
2. Content Accuracy (for paragraph)	4.85	0.36	Outstanding
3. Styles and Techniques/Creativity (for artwork)	4.70	0.46	Outstanding
4. Styles and Techniques/Creativity (for paragraph)	4.94	0.24	Outstanding
5. Appeal (for artwork)	4.91	0.28	Outstanding
6. Appeal (for paragraph)	4.89	0.32	Outstanding
7. Product/Output Totality	4.85	0.36	Outstanding
Grand Mean	**4.84**		**Outstanding**

Legend:

Scale	Range	Descriptor
5	4.20 – 5.00	Outstanding
4	3.40 – 4.19	Very Satisfactory
3	2.60 – 3.39	Satisfactory
2	1.80 – 2.59	Fair
1	1.00 – 1.79	Needs Improvement

Table 7 illustrates the level of performance of students towards integrative assessment material 3 (Mystery Cases, Solved!). Among the categories above, "Apply scientific evidence to defend conclusions" yielded the highest mean score *(M=4.88, SD=0.37)* and was remarked as Outstanding. This is followed by "Analysis of the key issues" and "Interprets the scenario with correct judgments" with a mean score *(M=4.74, SD=0.54)* and were also remarked as Outstanding. On the other hand, the category "Identification of the main issues and/or problems." *(M=4.67, SD=0.55)* received the lowest mean score of responses and yet was also remarked Outstanding.

Overall, the level of performance of students towards integrative assessment material 3 (Mystery Cases, Solved!) attained a mean score of 4.75 and was Outstanding among the respondents.

Table 7. Level of Students' Performance in terms of Integrative Assessment Material 3 (Mystery Cases, Solved!)

Category	Mean	SD	Descriptor
1. Identification of the main issues and/or problems.	4.67	0.55	Outstanding
2. Analysis of the key issues.	4.74	0.54	Outstanding
3. Observations and/or recommendations on effective solutions.	4.70	0.58	Outstanding
4. Interprets the scenario with correct judgments.	4.74	0.54	Outstanding
5. Apply scientific evidence to defend conclusions.	4.88	0.37	Outstanding
Grand Mean	**4.75**		**Outstanding**

Legend:

Scale	Range	Descriptor
5	4.20 – 5.00	Outstanding
4	3.40 – 4.19	Very Satisfactory
3	2.60 – 3.39	Satisfactory
2	1.80 – 2.59	Fair
1	1.00 – 1.79	Needs Improvement

Table 8 illustrates the level of performance of students towards integrative assessment material 4 (Treasure Hunt!). Among the categories above, "Hidden word 10" yielded the highest mean score *(M=4.46, SD=0.64)* and was remarked as Outstanding. This is followed by "Hidden words 1 and 2" with a mean score *(M=4.40, SD=0.70)* and were also remarked as Outstanding. On the other hand, the category "Hidden word 7" *(M=4.29, SD=0.70)* received the lowest mean score of responses and yet was remarked Outstanding.

Overall, the level of performance of students towards integrative assessment material 4 (Treasure Hunt!) attained a mean score of 4.38 and was Outstanding among the respondents.

Table 8. Level of Students' Performance in terms of Integrative Assessment Material 4 (Treasure Hunt!)

Category	Mean	SD	Descriptor
1. Hidden word 1	4.40	0.70	Outstanding
2. Hidden word 2	4.40	0.61	Outstanding
3. Hidden word 3	4.33	0.65	Outstanding
4. Hidden word 4	4.39	0.61	Outstanding
5. Hidden word 5	4.39	0.65	Outstanding
6. Hidden word 6	4.36	0.68	Outstanding
7. Hidden word 7	4.29	0.70	Outstanding
8. Hidden word 8	4.38	0.64	Outstanding
9. Hidden word 9	4.38	0.68	Outstanding
10. Hidden word 10	4.46	0.64	Outstanding
Grand Mean	**4.38**		**Outstanding**

Legend:

Scale	Range	Descriptor
5	4.20 – 5.00	Outstanding
4	3.40 – 4.19	Very Satisfactory
3	2.60 – 3.39	Satisfactory
2	1.80 – 2.59	Fair
1	1.00 – 1.79	Needs Improvement

Table 9 illustrates the level of performance of students towards integrative assessment material 5 (Bubbling Plants). Among the categories above, "Clearly states the topic, title of the activity and explicitly states the objectives and key questions to be answered" and "Makes clear and scientific observations based on experimental data (video)" yielded the highest mean score *(M=4.98, SD=0.16)* and were remarked as Outstanding. This is followed by "Answers to the guide questions are clearly explained and well-analyzed" and "Summary of learnings are well presented and discussed which includes other information from other sources or other experiments that can be used to relate to the topic" with a mean score *(M=4.96, SD=0.19)* and were also remarked as Outstanding. On the other hand, the statement "Provides accurate representation of data in graph and it is correctly labeled and titled" *(M=4.95, SD=0.22)* received the lowest mean score of responses and yet was remarked Outstanding.

Overall, the level of performance of students towards integrative assessment material 5 (Bubbling Plants) attained a mean score of 4.97 and was Outstanding among the respondents.

Table 9. Level of Students' Performance in terms of Integrative Assessment Material 5 (Bubbling Plants)

Category	Mean	SD	Descriptor
1. Clearly states the topic, title of the activity and explicitly states the objectives and key questions to be answered.	4.98	0.16	Outstanding
2. Makes clear and scientific observations based on experimental data (video)	4.98	0.16	Outstanding
3. Answers to the guide questions are clearly explained and well-analyzed	4.96	0.19	Outstanding
4. Provides accurate representation of data in graph and it is correctly labeled and titled.	4.95	0.22	Outstanding
5. Summary of learnings are well presented and discussed which includes other information from other sources or other experiments that can be used to relate to the topic.	4.96	0.19	Outstanding
Grand Mean	**4.97**		**Outstanding**

Legend:

Scale	Range	Descriptor
5	4.20 – 5.00	Outstanding
4	3.40 – 4.19	Very Satisfactory
3	2.60 – 3.39	Satisfactory
2	1.80 – 2.59	Fair
1	1.00 – 1.79	Needs Improvement

Table 10 illustrates the level of perception of students towards integrative assessment material in terms of ease of use. Among the statements above, "You can simply understand the language and terms used and the materials are free from grammatical errors. *(Madali mong naiintindihan ang wika/lenggwahe at mga terminong ginamit at walang mga pagkakamali sa gramatika ng mga materyal.)*" yielded the highest mean score *(M=4.51, SD=0.75)* and was remarked as Strongly Agree. This is followed by "You can easily access the materials included in the tasks. *(Madali mong mahanap ang mga materyales na kasama sa mga gawain.)*" with a mean score *(M=4.36, SD=0.86)* and was also remarked as Strongly Agree. On the other hand, the statement "You can clearly understand the instructions and procedures of the tasks. *(Malinaw mong nauunawaan ang mga tagubilin at pamamaraan ng mga gawain.)*" *(M=4.14, SD=0.84)* received the lowest mean score of responses and was remarked Agree.

Overall, the level of perception of students towards integrative assessment material in terms of ease of use attained a mean score of 4.28 and a standard deviation of 0.84 and was Very High among the respondents.

Table 10. Level of Perception of Students Towards Integrative Assessment Material in terms of Ease of Use

THE ASSESSMENT MATERIAL	MEAN	SD	REMARKS
1. You can do the tasks easily, safely, effectively, and efficiently while enjoying the experience. *(Maaari mong gawin ang mga gawain nang madali, ligtas, epektibo, at mahusay habang tinatamasa ang karanasan.)*	4.18	0.84	Agree
2. You can complete the task at a given time. *(Kaya mong kumpletuhin ang gawain sa nakatakdang oras.)*	4.20	0.89	Strongly Agree
3. You can clearly understand the instructions and procedures of the tasks. *(Malinaw mong nauunawaan ang mga tagubilin at pamamaraan ng mga gawain.)*	4.14	0.84	Agree
4. You can easily access the materials included in the tasks. *(Madali mong mahanap ang mga materyales na kasama sa mga gawain.)*	4.36	0.86	Strongly Agree
5. You can simply understand the language and terms used and the materials are free from grammatical errors. *(Madali mong naiintindihan ang wika/lenggwahe at mga terminong ginamit at walang mga pagkakamali sa gramatika ng mga materyal.)*	4.51	0.75	Strongly Agree
Overall Mean = 4.28 **Standard Deviation = 0.84** **Verbal Interpretation = Very High**			

Table 11 illustrates the level of perception of students towards integrative assessment material in terms of creativity. Among the statements above, "The tasks include reflective activities that measure what has been learned in the lessons and demonstrate thinking skills such as synthesis. (Napapaloob sa mga gawain ang repleksyon na masusukat ang mga natutuhan sa mga aralin at nagpapakita ng mga kasanayan sa pag iisip tulad ng sintesis.)" yielded the highest mean score (M=4.61, SD=0.68) and was remarked as Strongly Agree. This is followed by "The tasks have connection to real-world. (Ang mga gawain ay may koneksyon sa totoong mundo.)" with a mean score (M=4.54, SD=0.75) and was also remarked as Strongly Agree. On the other hand, the statement "The content of the tasks is engaging and entertaining. (Nakikita mong nakakaengganyo at nakakaaliw ang mga gawain.)" (M=4.34, SD=0.93) received the lowest mean score of responses yet was also remarked Strongly Agree.

Overall, the level of perception of students towards integrative assessment material in terms of creativity attained a mean score of 4.50 and a standard deviation of 0.79 and was Very High among the respondents.

Table 11. Level of Perception of Students Towards Integrative Assessment Material in terms of Creativity

THE ASSESSMENT MATERIAL	MEAN	SD	REMARKS
1. The content of the tasks are engaging and entertaining. *(Nakikita mong nakakaengganyo at nakakaaliw ang mga gawain.*	4.34	0.93	Strongly Agree
2. The tasks involve technological integration and models that reflect critical thinking skills. *(Gumagamit ito ng teknolohiya at mga modelo na sumasalamin sa mga kasanayan sa pag-iisip.)*	4.53	0.69	Strongly Agree
3. The tasks have connection to real-world. *(Ang mga gawain ay may koneksyon sa totoong mundo.)*	4.54	0.75	Strongly Agree
4. The tasks include reflective activities that measure what has been learned in the lessons and demonstrate thinking skills such as synthesis. *(Napapaloob sa mga gawain ang repleksyon na masusukat ang mga natutuhan sa mga aralin at nagpapakita ng mga kasanayan sa pag iisip tulad ng sintesis.)*	4.61	0.68	Strongly Agree
5. The tasks involve the creation of products as output. *(Kasama sa mga gawain ang paglikha ng mga produkto bilang awtput.)*	4.46	0.84	Strongly Agree
Overall Mean = 4.50 **Standard Deviation = 0.79** **Verbal Interpretation = Very High**			

Table 12 illustrates the level of perception of students towards integrative assessment material in terms of complexity. Among the statements above, "The materials promote multiple disciplines/subjects which means some parts of the task are connected to other subjects. *(Nakikita mo ang materyal na nagpo-promote ng maraming disiplina/paksa na nangangahulugan na ang ilang bahagi ng gawain ay konektado sa ibang mga paksa.)*" *(M=4.46, SD=0.87),* "The materials involve challenging and multiple skills in a single task. *(Nakikita mo ang material na nagsasangkot ng mapaghamong at maraming kasanayan sa isang gawain.)*" *(M=4.46, SD=0.69),* "The materials follow a method/procedure in doing a certain task. *(Nakikita mo ang materyal ay sumusunod sa isang pamamaraan/pamamaraan sa paggawa ng isang tiyak na gawain.)*" *(M=4.46, SD=0.79)* and "The materials foster higher-order thinking skills. *(Nakikita mo ang material na nagpapaunlad ng mga kasanayan sa mataas na antas ng pag-iisip.)*" *(M=4.46, SD=0.79)* yielded the highest mean and were remarked as Strongly Agree. On the other hand, the statement "The materials simulate real-world problems. *(Nakikita mo ang materyal na pinapaloob o konektado ang mga problema sa totoong mundo)*" *(M=4.33, SD=0.84)* received the lowest mean score of responses yet was also remarked Strongly Agree.

Overall, the level of perception of students towards integrative assessment material in terms of complexity attained a mean score of 4.50 and a standard deviation of 0.79 and was Very High among the respondents.

Table 12. Level of Perception of Students Towards Integrative Assessment Material in terms of Complexity

THE ASSESSMENT MATERIAL	MEAN	SD	REMARKS
1. The materials promote multiple disciplines/subjects which means some parts of the task are connected to other subjects. *(Nakikita mo ang materyal na nagpo-promote ng maraming disiplina/paksa na nangangahulugan na ang ilang bahagi ng gawain ay konektado sa ibang mga paksa.)*	4.46	0.87	Strongly Agree
2. The materials simulate real-world problems. *(Nakikita mo ang materyal na pinapaloob o konektado ang mga problema sa totoong mundo.)*	4.33	0.84	Strongly Agree
3. The materials involve challenging and multiple skills in a single task. *(Nakikita mo ang material na nagsasangkot ng mapaghamong at maraming kasanayan sa isang gawain.)*	4.46	0.69	Strongly Agree
4. The materials follow a method/procedure in doing a certain task. *(Nakikita mo ang materyal ay sumusunod sa isang pamamaraan/pamamaraan sa paggawa ng isang tiyak na gawain.)*	4.46	0.79	Strongly Agree
5. The materials foster higher-order thinking skills. *(Nakikita mo ang material na nagpapaunlad ng mga kasanayan sa mataas na antas ng pag-iisip.)*	4.46	0.79	Strongly Agree
Overall Mean = 4.44 **Standard Deviation = 0.80** **Verbal Interpretation = Very High**			

Table 13 illustrates the level of perception of students towards integrative assessment material in terms of action-centered. Among the statements above, "You have a sense of focus in achieving the goals of the tasks. *(Mayroon kang pakiramdam ng pagtuon sa pagkamit ng mga layunin ng mga gawain.)*" yielded the highest mean score *(M=4.26, SD=0.78)* and was remarked as Strongly Agree. This is followed by "You are willing to take practical action to solve a problem or situation. *(Ikaw ay handang gumawa ng praktikal na aksyon upang malutas ang isang problema o sitwasyon.)*" with a mean score *(M=4.25, SD=0.88)* and was also remarked as Strongly Agree. On the other hand, the statement "You set a timeline in doing the tasks. *(Nagtakda ka ng timeline sa paggawa ng mga gawain.)*" *(M=3.91, SD=1.09)* received the lowest mean score of responses and was remarked Agree.

Overall, the level of perception of students towards integrative assessment material in terms of action-centered attained a mean score of 4.08 and a standard deviation of 0.95 and was High among the respondents.

Table 13. Level of Perception of Students Towards Integrative Assessment Material in terms of Action-Centered

THE ASSESSMENT MATERIAL	MEAN	SD	REMARKS
1. You feel the enthusiasm, confidence and surge of energy in doing the tasks. *(Nararamdaman mo ang sigasig, kumpiyansa at surge ng enerhiya sa paggawa ng mga gawain.)*	3.95	0.98	Agree
2. You have a sense of focus in achieving the goals of the tasks. *(Mayroon kang pakiramdam ng pagtuon sa pagkamit ng mga layunin ng mga gawain.)*	4.26	0.78	Strongly Agree
3. You are willing to take practical action to solve a problem or situation. *(Ikaw ay handang gumawa ng praktikal na aksyon upang malutas ang isang problema o sitwasyon.)*	4.25	0.88	Strongly Agree
4. You feel motivated in doing the tasks. *(Nakaramdam ka ng motibasyon sa paggawa ng mga gawain.)*	4.00	0.94	Agree
5. You set a timeline in doing the tasks. *(Nagtakda ka ng timeline sa paggawa ng mga gawain.)*	3.91	1.09	Agree
Overall Mean = 4.08 **Standard Deviation = 0.95** **Verbal Interpretation = High**			

Table 14 presents the significant relationship between the students' mean performance in terms of the performance tasks and the students' perception towards the integrative assessment materials.

The students' mean performance is observed to have no significant relationship with the students' perception on the ease of use (r=0.170), creativity (r=0.018), complexity (r=0.024), and action centered (r=0.192) of the integrative assessment materials. The computed r values of the first three were is less than the critical value of 0.185 which is the basis for the determination of the hypothesis. Also, all of the tests incurred p-values which were greater than the significance alpha 0.05 which implies the tests lacking significance.

From the findings above, we can infer that at 0.05 level of significance, we can infer that the null hypothesis "There is no significant relationship between the students' mean performance in terms of the performance tasks and the students' perception towards the integrative assessment materials" is true. Hence, there is no observed relation that exists between the two.

Table 14. Significant Relationship Between the Students' Mean Performance in terms of the Performance Tasks and the Students' Perception towards the Integrative Assessment Materials

	Students' Perception	Computed r	Strength	Critical r	p-value	Analysis
Students' Mean Performance	Ease of Use	0.170	Very Weak	0.185	0.131	Not Significant
	Creativity	0.018	Very Weak	0.185	0.880	Not Significant
	Complexity	0.024	Very Weak	0.185	0.834	Not Significant
	Action-Centered	0.192	Very Weak	0.185	0.088	Not Significant

Legend:

Range	Verbal Interpretation
0.80-1.00	Very Strong
0.60-0.79	Strong
0.40-0.59	Moderate
0.20-0.39	Weak
0.00-0.19	Very Weak

4. CONCLUSION AND RECOMMENDATION

Based from the findings, the following conclusions were drawn.

1. The researcher therefore conclude that the integrative assessment materials which reflect these characteristics in terms of structure and logistics, intellectual designs, grading and scoring and fairness could be used as authentic assessment tool in teaching Science. It is considered as valid assessment tool in teaching Science that can be used by all teachers because having all these characteristics combined into a single assessment ensures the authenticity of learnings which is the primary goal of education.

2. The researcher therefore conclude that the level of students' performance upon utilizing the five integrative assessment materials resulted to excellent/outstanding and high scores. Students' performance improved as a result of these integrative learning assessment materials. This can only signify that the skills and competencies of the lessons were successfully acquired. It is observable that these materials assist students in solidifying their learnings while also developing and broadening their knowledge and skills, not only in Science subject but also on other disciplines/subject areas.

3. The researcher therefore conclude that the students' perceptions toward the integrative assessment material vary in terms of ease of use, creativity, complexity and action-centered. Students have varying views on how they find these materials. Since this is not the typical type of assessment that they are used to, others perceived it as difficult and challenging to do and some have experienced a hard time finishing the tasks due to limited time and resources. On the positive side, other students believed that this sharpened their minds and also widened their learning experiences in studying the lessons especially in attaining the integrated competencies. Because of this, learning becomes more enjoyable and exciting.

4. The researcher therefore conclude that there is no significant relationship between the students' mean performance in terms of the performance tasks and the students' perception towards the integrative assessment materials.

This study has contributed in the validation and utilization of the integrative learning assessment as authentic assessment tool in teaching Science. As the study progressed, some recommendations are suggested. These are as follows:

1. Further researches shall be made on knowing the significance of this kind of assessment in developing students' professional competencies and skills that can enhance their capabilities on future courses. Students will be more prepared for their career and future workplace.

2. For better planning and implementation of this kind of assessment, it is much better to strengthen teachers' capacity, knowledge and resources. The Department of Education must provide assessment guidance to schools and level up the teachers' professional development.

3. Other teachers who teach different disciplines/subjects can also use these integrative learning assessment materials. As a result, they will be able to save time when preparing various assessments for a certain subject. They can work together to plan these materials.

4. Based on the positive results/scores of students in utilizing the integrative assessment materials, it can be suggested that these integrative assessment materials will be study outputs for all the Science teachers to peruse in City Schools Division of Cabuyao.

5. Further researches shall be made for a clearer distinction between the traditional assessment such as pen and paper test and the performance-based assessment like the integrative assessment in order to gain a greater understanding and clarity on the possible outcomes and reward of these assessments. In addition, they can propose to incorporate these different assessments across a course of study and making them more apparent and evident to students.

6. To overcome the students' challenges when it comes to time and resources, in planning and designing the assessment materials, it is suggested to choose smaller-scale activities/tasks where time and financial support such as resources will not require them to spend so much money, and provide them with a clear timeline or breakdown of tasks for them to be able to concentrate and focus on accomplishing the tasks.

7. In terms of the tasks that are designed to do by large group of students, it is recommended that there can be two sets of tasks that can be done by the students either in groups or individually. In this way, they will have options to effectively execute the tasks in their most comfortable way considering their best interests, needs and backgrounds.

8. To address the problems of students having lack of motivation and concentration, it is advisable to communicate with them and have a regular consultation. It is essential to have an open communication with students in order to know what they are going through and provide them with necessary assistance and support to help them overcome their difficulties.

5. ACKNOWLEDGMENTS

This thesis becomes possible because of the kind help and support of many special individuals. I would like to extend my deepest gratitude to all of them.

Foremost, I would like to give special thanks to **DR. JULIE P. MENDOZA**, my thesis adviser, for sharing her immense knowledge, insightful comments and providing me assistance to finish my study.

My sincere thanks also to the thesis committee, **DR. VILMA M. GERONIMO**, our technical expert, **A/P MARIE ANN GONZALES**, our internal statistician, DR. **REGINA E. GLORIA**, our subject specialist, **DR. MICHAEL WILLIAM V. PUNA III**, our external panel, for their time, suggestions and questions that made me understand better my research. Special thanks also to **DR. BENJAMIN O. ARJONA**, my external statistician and **DR. NIMFA DIMACULANGAN**, our language critic, for extending their help and imparting their technical expertise to complete my thesis.

I thank my fellow classmates and friends for the encouragement and never ending discussions that enlighten each one of us on what we need to accomplish.

To my family, relatives and special someone, for their continuous support, help and understanding throughout the journey of my research.

Finally, and most especially, I would like to give the highest gratitude and praises to our God Almighty for my strength to overcome any difficulties that comes my way, for my peace of mind and good health. You are the reason who let me to finish my study. I will keep on believing and trusting you for my future.

6. REFERENCES

Andrade, H. (2019). *A critical review of research on student self-assessment. Frontiers in Education.*

Atkin, J. M., Black, P., & Coffey,J. (2001). *Classroom assessment and the National Science Education Standards*. Washington, D.C.: National Academy Press.

Balderas, A., Palomo-Duarte, M., et al. (2018). International Journal of Educational Technology in Higher Education. Volume 15, Article number: 40.

Brown and Hudson. (2018). *Alternatives in assessment*. EF Lections Vol. 25, No. 1.

Collins, R. (2013). *Authentic assessment: assessment for learning.* Curriculum and Leadership Journal. Volume 11 Issue 7.

Crisp, G. T. (2010). *Integrative assessment: reframing assessment practice for current and future learning*. pages 33-43

Fook, C. Y., and Sidhu, G. K. (2010). Authentic Assessment and Pedagogical Strategies in Higher Education. *Journal of Social Sciences 6 (2): 153-161, 2010 ISSN 1549-3652.*

Geneseo. (2021). *Center for Integrative Learning.*

Hargreaves, E. (2007). *Assessment in Education Principles Policy and Practice*. University College London. https://doi.org/10.1093/acrefore/9780190264093.013.22

Kitchen, H., Bethell G., Fordham E., et al. (2019). *OECD Reviews of Evaluation and Assessment in Education: Student Assessment in Turkey.*

Koh, K. H. (2017). *Authentic Assessment*.

Levitt, S. D., & Dunbar, S. J. (2005). *Freakanomics: A rogue economist explores the hidden side of everything.* New York: Morrow.

Marcinek, A. (2011). *Importance of Collaborative Assessment in a 21st Century Classroom.*

Mark D. Shermis and Francis J. Di Vesta (2011). *Classroom Assessment in Action.*

Murdock, T., & Anderman, E. M. (2006). *Motivational perspectives on student cheating: Toward an integrated model of academic dishonesty*. Educational Psychologist, 41(3), 129-145.

Nichols, S. I., & Berliner, D. C. (2007). *Collateral damage: How high-stakes testing corrupts America's schools*. Cambridge, MA: Harvard Education Press.

Paul Black & Dylan Wiliam (2018): *Classroom assessment and pedagogy, Assessment in Education: Principles, Policy & Practice*.

Popham, W. J. (2008). *Classroom assessment: What teachers need to know (5th ed.)*. Boston, MA: Allyn and Bacon.

Roediger, H. L., III, & Karpicke, J. D. (2006). *The power of testing memory: Basic research and implications for educational practice*. Perspectives on Psychological Science, 1(3), 181-210.

Romero, M., & Vallerand, V. (2016a). *Guide d'activites technocreatives pour les enfants du 21e siecle* (Vol. 1). Quebec, QC: Createspace.

Runco, M.A. (2014). *Creativity: Theories and Themes: Research, development and practice*. Elsevier.

Shannon, K. C., Kearney, S., and Galstaun, V. (2017). *Article Using a Collaborative Assessment Design to Support Student Learning*.

Shaw, A. (2020). *Authentic assessment in the online classroom center for teaching and learning: Wiley education services*.

Shepard, Lorrie A. (2019). *Classroom Assessment to Support Teaching and Learning*. The ANNALS of the American Academy of Political and Social Science, 683(1), 183–200.

Slater, T. F. (2005). *Field-tested learning assessment guide.*

Stiggins, R., & Chappuis, J. (2010). *What a difference a word makes: Assessment FOR learning rather than assessment OF learning helps students succeed*.

Suskie, L. (2018). *Assessing Student Learning: A Common Sense Guide, 3rd Edition.*

Teaching and Teacher Education. (2000). *Authentic assessment of teaching in context*. Volume 16, Issues 5–6, pages 523-545.

Thomas, P. (2021). *The Importance of ease of use*. Knack Notes.

Wiggins, G. (2020). *27 characteristics of Authentic Assessment. TeachThought*.

Williams, M. K. (2017) John Dewey in the 21st Century. *Journal of Inquiry & Action in Education.* University of West Florida.

Yell, M. L., & Drasgow, E. (2005). *No Child Left Behind: A guide for professionals*. Upper Saddle River, NJ: Pearson Merrill Prentice Hall.