Investigating Science Teachers' Competencies in Classroom Assessment and Its Implications to Curriculum Management

Vida V. Antonio[1], Aris Reynold V. Cajigal [2], Aleli R. Martin[3], Marc Paul T. Calzada[4] and Virginia J. Aurelio[5]

Abstract

This descriptive research investigated competencies in classroom assessment of 155 Science teachers, chosen via total enumeration from public secondary schools of the province of Ilocos Norte, Philippines. They answered with consent an experts'-validated survey questionnaire in Google Forms and a semi-structured interview guide via Messenger and Google Meet. Data gathered were analyzed and interpreted using frequency, percentage, mean and rank. Results showed that the teachers in Science are generally at a low level of competency along the seven standards of assessment Mariano Marcos State University, College of Teacher Education, Laoag City; most of them used multiple choice, identification, performance assessment, and problem solving but not much of cloze tests, portfolio and e-assessments. The teachers' top ranked problems in doing assessment include time for checking and test preparation; students' guessing their answers and low/poor performance; and finding the quality of tests via reliability and validity computation. They claimed that they need training along general assessment, trends in assessment and alternative assessment. The low level of competency of the teachers in assessment defines the types of assessment methods they use and adds up in the difficulties they encountered in assessing their students' performance. The results imply curriculum enhancement for existing subjects on assessment as well as instructional enhancement for teachers. The results could serve as basis in crafting a training program on assessment that includes seminar-workshops/trainings on the seven standards of assessment, test construction, test analysis, using authentic assessment, and trends in assessment, is proposed to equip teachers with knowledge and skills in formulating valid and reliable tests.

Keywords: *Classroom Assessment, Methods, Problems, Science Teachers, Training Needs.*

INTRODUCTION

Assessment of learning is one of the crucial steps in the teaching-learning process. Since it decides whether the educational objectives are being reached, it is seen as a crucial component of instruction. Grades, placement, advancement, instructional needs, curriculum, and, in some situations, funding decisions are influenced by assessments (Edutopia, 2008). It is, in fact, one of the powerful educational tools for promoting learning.

Classroom evaluation has steadily risen to the top of the list of issues in educational institutions. As time goes on, schools adopt new evaluation techniques to meet the demands of the always evolving curriculum. It is important for school improvement because of its influence and impact on the process of teaching and learning. Every teacher and school should prioritize assessment in general since it may be used to advance teaching and learning. (Lasaten, 2016, p.55).

According to Navarro and De Guzman-Santos (2013), an organized and rational method of learning about what kids know and are capable of is assessment. Such data may be gathered by watching students while they engage in educational activities, looking at the outcomes of such activities, or assessing students' knowledge and abilities. Historically, teachers base their student marks on the results of assessments. Today's teachers, however, employ assessment not merely to determine students' grades but also to enhance classroom instruction and student learning. Creating exams and performance metrics, grading, deciphering test findings, conveying test results, and applying assessment outcomes in decision-making are all part of classroom

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[1] Faculty, Mariano Marcos State University, College of Teacher Education, Laoag City, Philippines, Email: vvantonio@mmsu.edu.ph

[2] Faculty, Mariano Marcos State University, College of Teacher Education, Laoag City, Philippines, Email: arvcajigal@mmsu.edu.ph

[3] Faculty, Mariano Marcos State University, College of Teacher Education, Laoag City, Philippines, Email: armartin@mmsu.edu.ph

[4] Faculty, Mariano Marcos State University, College of Teacher Education, Laoag City, Philippines, Email: mtcalzada@mmsu.edu.ph, (Corresponding Author)

[5] Faculty, Mariano Marcos State University, College of Teacher Education, Laoag City, Philippines, Email: vjaurelio@mmsu.edu.ph

assessment. Therefore, it is crucial that educators understand the advantages and disadvantages of each type of evaluation. They should choose right formats to assess student achievements (Stiggins, 2012), and subject tests to item analysis to establish their reliability. Therefore, assessment entails looking over learning materials like journal entries, written work, portfolios, skill demonstrations, and performance in learning activities. It also involves looking over test results and rubric ratings, which span a period of time and should show how students are progressing with their competencies.

According to Hamlin (2016), The data gathered from assessments can be utilized to enhance student learning, enhance instruction, and share proof of the learning process with others (accountability).

LITERATURE REVIEW

An assessment needs to be practical, precise, and long-lasting to be successful. When done successfully, it can enliven teachers' job by giving them knowledge they can use to better assist students, and it is an intellectually stimulating and demanding investigation of how students learn in practical settings. It is important to focus properly done assessments as well. Just evaluate one or two learning objectives at once. Decide on a select few learning outcomes that are essential to a program's success. Assessments ought to be enduring. It shouldn't be something extra that a teacher does on top of their regular duties. Regular assessments should be conducted as part of class activities. Calzada and Antonio (2023) emphasized that for effective learning to take place, students should be provided with varied activities. More so, a good teacher must adapt his methods and learning materials to the nature of the individual child and his level of development

In 1990, the American Federation of Teachers and the National Council on Measurement in Education created standards for teacher competence in student assessment. These standards are meant to serve as a guide for teacher educators as they develop and approve programs for teacher preparation, as well as a self-assessment tool for teachers to determine their needs for professional development in student assessment.

The Standards for Teacher Competence in Educational Assessment of Students are: "1) Teachers should be skilled in choosing assessment methods appropriate for instructional decisions; 2) Teachers should be skilled in developing assessment methods appropriate for instructional decisions; 3) The teacher should be skilled in administering, scoring and interpreting the results of both externally-produced and teacher-produced assessment methods; 4) Teachers should be skilled in using assessment results when making decisions about individual students, planning teaching, developing curriculum, and school improvement; 5) Teachers should be skilled in developing valid pupil grading procedures which use pupil assessments; 6) Teachers should be skilled in communicating assessment results to students, parents, other lay audiences, and other educators; and 7) Teachers should be skilled in recognizing unethical, illegal, and otherwise inappropriate assessment methods and uses of assessment information."

Conceptual and application skills in assessment are expected of teachers who meet the standards listed above. They will be aware of the laws and court rulings that have an impact on the assessment procedures used in their classrooms. Instructors will be aware that many assessment techniques can be abused or overused leading to negative outcomes such as embarrassing children, breaching a student's right to confidentiality, and inappropriately using students' standardized achievement test scores to judge teaching effectiveness.

Rustaman (2017) cited that there is closed relationship between Science instruction and Science assessment. The nature of assessment is needed to be developed in the nature of science as inquiry, active assessment for active science. Assessment can be differentiated into 'assessment of learning', 'assessment for learning', and 'assessment as learning' based on the goal, whereas based on its function it can be differentiated into formative assessment and summative assessment. She concluded in her study that a combination of paper and pencil test focusing on multiple choice test item with reason, and performance or alternative assessment is proposed as a model of scientific reasoning/intellectual literacy as science learning outcome of high school students. The alterative assessment is in the form of task and rubrics that reflects 21st century skills which consider as part of four competencies (4Cs). The test on scientific reasoning skills literacy and rubrics for assessing the essence of each level of inquiry can be developed gradually with the involvement of graduate students through their investigation in their thesis writing. Lastly, the perspective of the nature of science, the nature of science literacy

and the nature of assessment, it is focused to empower the assessment for learning and as learning to complete the assessment of learning.

Since they are familiar with their students, the curriculum, the content, and the procedures currently in use in teaching and learning, teachers have control over assessments. Teachers also fully understand the objectives of the curriculum, which direct them in choosing the elements that will be examined. Since they are in charge of the assessment process, their assessment procedures, issues, and trainings must be identified in order to enhance their assessment practices, which will subsequently result in enhanced teaching and learning (Lasaten, 2016).

It is of the above context that this research work was conceptualized. The abilities (knowledge and skills) of Science teachers with regard to classroom assessment may have an impact on how they carry out their classroom instruction, hence, a study on classroom assessment is imperative.

This study was performed to determine, analyze, and describe the Science teachers' competencies in designing assessment tools and utilizing assessment strategies. Specifically, this research was geared to investigate the level of teachers' competencies (knowledge and skills) in designing assessment tools and utilizing assessment strategies in Science; the assessment methods used by teachers in teaching Science; the assessment problems encountered by the teachers and the training needs of teachers in designing assessment tools and utilizing assessment strategies. Implications of the result to curriculum management, specifically on curriculum and instructional enhancement of teachers were also drawn.

Results of the study could benefit teachers in all disciplines since the concern of the research work is directly drawn from them. They could be informed on how they are doing in line with assessing their students' as their strengths and weaknesses and of their needs as evaluators of learning. These could serve as springboard in improving their classroom assessment practices. Students could also be benefited because their outputs will be evaluated using appropriate assessment tools and they will be exposed to different assessment techniques that could better help them develop their potentials. Administrators can benchmark from the results of the study in developing training programs, seminar-workshops or forum/symposium to address the needs of teachers in line with assessment. The results could also be used by curriculum developers for curriculum enhancement of existing subjects on assessment and could help improve teachers 'competencies (knowledge and skills) in designing assessment tools and utilizing assessment strategies. The findings of this research work can be used as data in crafting a framework in designing assessment tools and utilizing assessment strategies, that can be used in the conduct of an extension activity in the form of seminar-workshops with the aim of equipping teachers with good practices in terms of skills and knowledge on designing assessment tools and utilizing assessment strategies.

This study was anchored on Continual Improvement Theory and Adult Learning Theory. Teachers are committed and motivated to make changes, according to the Continual Improvement theory. They are undoubtedly inventive and curious individuals who enjoy trying new things. But the majority of the time, teachers work alone. They identify what works and does not in their classroom and finally make modifications to better their practice. Likewise, the Adult Learning Theory or Andragogy developed by Malcolm Knowles (1980) highlights how adults learn or best respond to learning. It provides insight into how adults, which refers to teachers in this study, become more effective in practice and more responsive to their learners' needs. The theory is based on the assumptions of self-concept, adult learner experience, readiness to learn, orientation of learning and motivation to learn.

METHODOLOGY

Research Design

The research employed the descriptive research design aimed to investigate the competencies in classroom assessment of Science teachers in the province of Ilocos Norte in northern Philippines. This design was chosen to provide a comprehensive understanding of the current state of assessment competencies among the targeted population and to cite implications to curriculum management.

Sample and Data Collection

It was conducted in the public secondary schools of the three schools' division of the province namely: Laoag City, City of Batac and Ilocos Norte Divisions. Participants are all the Science teachers in the public secondary schools in these DepEd divisions. The 155 Science teachers who participated in this study are the in-service teachers who currently teach Science in school years 2019 – 2020 and 2020 – 2021 who were chosen via total enumeration. Two (2) instruments were used in gathering the needed data: survey questionnaire with adapted checklists from Lasaten (2016) and the Assessment Literacy Inventory (ALI) developed by Cynthia Campbell, Ph.D. of Northern Illinois University, and Craig A. Mertler, Ph.D., Bowling Green State University (2004), that is related to the seven "Standards for Teacher Competence in the Educational Assessment of Students"; and a semi-structured interview protocol to substantiate the data gathered by the questionnaire. Both instruments were subjected to internal validation by three (3) education and research experts in the field and were revised incorporating their comments and suggestions.

Prior to data collection, the researchers secured an ethical clearance from the University Research Ethics Review Board (URERB). Upon approval, permission to conduct the study was requested from the Schools Division Superintendents of the three (3) DepEd Divisions of Ilocos Norte and School heads who supervise the teachers. Moreover, consent of teacher-respondents in responding to the questionnaire was secured. Data gathering started upon the approval of the request. The teachers were given detailed instructions on how to accomplish the questionnaire and enough time to respond. Questionnaires were in Google Form and was uploaded and sent to the e-mails or messenger accounts of the respondents. Both distribution and retrieval of questionnaires were done online to adhere to the restrictions imposed by the Inter Agency Task Force (IATF) guidelines during the pandemic.

To substantiate the results from the survey questionnaire, selected teachers were randomly chosen to answer the interview protocol. A messenger chat group was created for this purpose. Since some of the teachers sampled have weak or intermittent internet connectivity and were very busy with their school forms and reports, the questionnaire was sent to them via their emails or messenger and their responses were also sent via email or messenger. They were also given enough time to accomplish the interview questionnaire.

Data Analysis

The data gathered in this study were tabularized, analyzed, and interpreted using several statistical measures and qualitative analysis techniques. Frequency counts and percentages were used to determine the occurrence and distribution of different assessment methods employed by the Science teachers. These measures allowed researchers to understand the relative popularity and usage of various assessment techniques within the sample.

Weighted means were calculated to assess the overall competency level of the teachers across the seven standards of assessment. By assigning appropriate weights to each standard, researchers were able to quantify and compare the teachers' proficiency in different aspects of assessment. This analysis provided a comprehensive view of the teachers' overall assessment competencies and identified areas that required improvement.

Rank analysis was employed to prioritize and rank the problems faced by the Science teachers in their assessment practices. By assigning numerical values to each problem based on its perceived significance, researchers determined the order of importance for addressing these issues. This ranking allowed for a focused approach in addressing the most critical challenges encountered by the teachers.

Additionally, the interview results were carefully analyzed, and themes were identified. Qualitative analysis techniques, such as thematic analysis, were used to explore and identify common patterns, themes, and perspectives emerging from the interview data. This qualitative analysis complemented the quantitative findings by providing deeper insights into the teachers' experiences, challenges, and training needs related to assessment. By systematically analyzing the interview data, researchers were able to gain a nuanced understanding of the teachers' perspectives and extract valuable qualitative information to support the overall research findings.

FINDINGS / RESULTS

This part of the research presents a comprehensive presentation, analysis and thorough discussion of the data gathered in the study.

Science Teachers' Level of Competence Along the Standards of Assessment

Table 1 shows the Science teachers' level of competence along with the seven (7) standards of assessment. As the results reveal, the teachers believe they have *Low* competence on assessment, as indicated by the overall mean of 1.50. It is further noted that the teachers have the same level of competence as reflected by the overall computed standard deviation of 0.90.

Table 1. Science teachers' level of competence along the standards of assessment.

Standard	Mean	SD	DI
Choosing assessment methods appropriate for instructional decisions	2.03	0.92	L
Developing assessment methods appropriate for instructional decisions	0.74	0.80	VL
Administering, scoring, and interpreting results of both externally-produced and teacher produced assessment methods	1.68	0.95	L
Using assessment results when making decisions about individual students, planning teaching, developing curriculum and making recommendations for school improvement	1.42	0.76	VL
Developing valid grading procedures which use pupils' assessment	1.28	0.83	VL
Communicating assessment results to students, parents, other lay audiences and other educators	1.23	0.92	VL
Recognizing unethical, illegal and otherwise inappropriate assessment methods and uses of assessment information	2.05	1.10	L
Overall Mean	**1.50**	**0.90**	**L**

Legend: Range of Mean   Descriptive Interpretation (DI)
4.50 – 5.00   Very High (VH)
3.50 - 4.49   High (H)
2.50 – 3.49   Average (A)
1.50 – 2.49   Low (L)
0.00 – 1.49   Very Low (VL)

The teachers' mean scores among the seven (7) competencies along standard assessment range from 0.74 to 2.05, which has a descriptive interpretation of *Very Low* to *Low*. This could mean that the teachers need upskilling through engagement in professional development programs to improve these competencies. It could also imply enhancement of the curriculum content of Professional Education courses on assessment of Teacher Education Institutions (TEIs) since these TEIs train and prepare content and pedagogy of pre-service teachers. This result corroborates with the findings of Andrade (2021) that Senior High School Physics teachers have a high need for professional development programs and activities on assessment, particularly online and authentic assessments.

Data in Table 1 further show that the teachers' competency in *developing assessment methods appropriate for instructional decisions*, d*eveloping valid grading procedures which use pupils' assessment,* and *using assessment results when making decisions about individual students, planning teaching, developing curriculum, and making recommendations for school improvement* is *Very Low.* This could mean that despite the various assessment methods available, the teachers are not proficient in making appropriate assessment methods to systematically provide a framework for aligning resources to meet the needs of the students.

The teachers' competence in *communicating assessment results to students, parents, other lay audiences, and other educators* is likewise *Very Low.* This could mean that the parent-teacher conference that is part of every school year calendar and Parent-Teacher Association (PTA) general assemblies are not sufficient for the teachers to discuss their children's academic progress and social behavior with parents. Based on DepEd Order 007, s. 2020 or the School Calendar and Activities for School Year 2020-2021, parent-teacher conferences (PTC) shall be done not earlier than the Second Saturday after the examinations for the first three Academic Quarters. It will be used as a venue to appraise the parents on their children's performance and ensure their involvement in school activities.

Assessment Methods Used by Teachers in Teaching Science

Table 2 shows the distribution of respondents according to the assessment methods used in teaching Science in the two classifications.

Table 2. Distribution of teachers according to their assessment methods used in Science.

Assessment Methods	Frequency (n=155)	Percentage (%)	Rank
Traditional Assessments			
Cloze Test	28	18.06	7
e-assessments (*Kahoot!*, Plickers, etc)	65	41.94	6
Enumeration	95	61.29	5
Identification	134	86.45	2
Matching Type	125	80.65	4
Multiple Choice	154	99.35	1
True-False Test	128	82.58	3
Authentic Assessments			
Concept Map	115	74.19	3
Essay Test	104	67.10	4
Performance Assessment	131	84.52	1
Portfolio Assessment	72	46.45	6
Problem Solving	128	82.58	2
Product-based Assessment	95	61.29	5

Table 2 reflects that Science teachers employ a variety of assessment methods in their classes, which are classified as traditional or authentic.

It can be gleaned from Table 2 that in terms of traditional assessments, almost all the teachers (154 or 99.35%) are using *multiple choice* type of assessment, which is ranked first; while 134 (86.45%) of them use *identification* as it came in second in rank. True-False test and matching type follows closely.

In terms of authentic assessments, it can be noticed that *performance assessment* is ranked first because most of the teachers (131 or 84.52%) use it, followed by *Problem solving* (128 or 82.58%) and concept map (115 or 74.19%) as these kinds of test ranked second and third, respectively. This is not surprising because Science involves laboratory works, which require students to actively perform activities. Antonio (2018) cited that teaching Science as a subject has always been associated with experimentation or laboratory work. Experiences of laboratory work; feel of apparatuses, materials and natural phenomena; events; and working with hands are essential and vital parts of Science education. Also, the language of Science is Mathematics, hence, it naturally involves formulas and equations that require numbers and a lot of analysis.

The above results imply that the teachers use different types of assessment methods in teaching Science as they use a balance of traditional and authentic that are performance-based, and outcome/product-based. However, it can also be deduced from the table that the *Cloze Test* ranked last, followed by e-assessments and portfolio assessment. This means that the teachers are not commonly using these methods. It is implied that they are not that familiar and competent in using these methods, hence, a training on the use of these tools is imperative. The results are not directly in accordance with the findings of Akiri, E., Tor, H.M., and Dori, Y.J. (2021) that the most implemented assessment method in Science teaching was tests with open- and closed-ended questions, followed by project portfolios and experiment reports. The methods used by the Science teachers in assessment could also be attributed to the grading system imposed by DepEd during the conduct of the study wherein the Science grade of a student is computed with the following weights: Written works (40%), Performance Tasks (40%) and Quarterly Assessment (20%).

Assessment Problems Encountered by Science Teachers

Table 3 shows the distribution of teachers according to their assessment problems in Mathematics. Three areas were included in this study. These are *testing-and test-related, student-related and testing in general.*

Table 3. Distribution of teachers according to their assessment problems in Science. (n=155)

Problem	f	%	Rank
A. Testing- and Test-related Problems			
Time for checking	**139**	**89.67**	1
Reproduction of test	82	52.90	5
Writing directions	48	30.96	8
Coverage of the test	65	41.94	6
Test preparation	**130**	**83.87**	2
Types of questions or test	**110**	**70.97**	3
Scheduling of test	52	33.54	7
Errors in test	84	54.19	4
B. Student-related Problems			
Low/Poor performance	**143**	**92.26**	2
Poor preparation for the test	123	79.35	3
Attitude and behavior	117	75.48	5
Cheating	120	77.42	4
Guessing on the test	**146**	**94.19**	1
C. Testing in General			
Quality of tests: Reliability & Validity	**75**	**48.39**	1
Lack resources	12	7.74	4
Appropriateness of Items to Learners	30	19.35	3
Interpreting test results	**32**	**20.64**	2

On Teachers' Assessment Problems, almost one-fifth (139 or 89.67%) of the respondents identified *time for checking* the learners' outputs and tests papers ranked first as a problem in the assessment process. Nearly the same number (130 or 83.87%) of respondents also recognized *test preparation* as a challenge which ranked second. *The types of questions or test* (110 or 70.97%) and identifying *or presence of errors in the test* (84 or 54.19%) came in 3rd and 4th, respectively. These results are congruent to the level of competency of the teachers along the standard *developing assessment methods appropriate for instructional decisions* is *very low* as reflected in Table 1. This could imply that the teachers need to be trained in this aspect.

In terms of **Student-related Problems of** the teachers, they generally claimed that students *guessing on their answers on a test* is the top (146 or 94.19%) among the identified challenges. This result implies that the type of assessment given to the students gives opportunity for the students to guess the answers to the given question. It could also be associated to the most common type of assessment used by the teachers which is the Multiple-Choice type of test. In this kind of test, the students are given options for possible answer which may give them the chance to just guess their answers.

In terms with Testing in General, based on the data gathered, the number 1 (48.39%) challenge the teachers identified is the *quality of test specifically on reliability and validity*, while *interpreting test results* ranked 2. This result implies that the teachers face challenges whether the test materials used are consistent to the scope and if they are measuring what it is intended to be measured. The data also implies that they are challenged in interpreting test results which could affect the evaluation process specially if such assessment is the basis

whether the learners have learned or gained something from the topics being taught. This result is consistent with the findings in Table 1 wherein the teachers have a *low* competency in the standard *administering, scoring, and interpreting results of both externally-produced and teacher produced assessment methods.*

Another challenge identified was the *appropriateness of items* to learners. Almost one-fifth (30 or 19.45%) of the teachers identified that they are not confident whether the test items are too easy or too hard for the learners.

It is notable however, that only a few (12 or 7.74%) claimed that lack or resources is a challenge for them. This implies that their schools and they themselves are equipped with resources needed in assessing the performance of their learners. It signifies the importance placed on assessment and the commitment to supporting teachers in implementing quality assessment practices. The availability of resources ensures that teachers have access to assessment materials, technology infrastructure, support materials, and professional development opportunities. These resources contribute to the overall effectiveness of the assessment process and enable teachers to make informed instructional decisions based on reliable and valid assessment data.

Training Needs of Science Teachers in Designing

Assessment Tools and Utilizing Assessment Strategies

Professional development is indeed a comprehensive, sustained, and intensive approach aimed at enhancing the effectiveness of teachers and administrators in raising students' achievement. It encompasses a range of activities and initiatives designed to support educators in their continuous growth, learning, and professional practice. In North America, there is relatively little emphasis on assessment in the professional development of teachers (Stiggins, 2002). This part of the study presents the data gathered on the perceives training needs of teachers which is presented in Table 4 below.

Table 4. Distribution of teachers according to their assessment training needs in Science. n=155

Training	f	%	Rank
General: Assessment, measurement, testing, evaluation	**112**	**72.26**	**1**
Test construction and Item writing	85	54.84	5
Trends in assessment and testing	**99**	**63.87**	**2**
Alternative assessment: Portfolio and performance assessment	**93**	**60.00**	**3**
Test item review and item analysis	90	58.06	4
Test preparation and feedback	74	47.74	7
Others: Testing methods, use of computer applications, all trainings related to testing, etc	82	52.90	6

As reflected in Table 4, 112 (72.26%) of the teachers identified that their topmost assessment training need is on *assessment, measurement, testing, and evaluation in general.* This result could mean that trainings on assessment in general should be conducted to capacitate the teachers. Majority of them claimed that they need a training on *trends and assessment and testing* (99 or 63.87%), and on *alternative assessment: portfolio and performance assessment* (93 or 60.00%), which are ranked 2nd and 3rd, respectively. This data implies the teachers are in need of up-to-date trends under this area specially this time of fast-pacing educational change brought by different factors such as modernization, and the pandemic. The use of e-assessments is also one of the trends. Antonio and Lorenzo (2019) cited that the K to 12 curriculum that is presently implemented in the Philippines is integrative, inquiry-based, constructivist and technology-enhanced because it fosters the development of information, media and technology skills among students. In order to achieve a curriculum like this, the appropriate information technology must also be used not only in teaching and learning but also in school administration, particularly in curriculum management.

The data could mean that some teachers are not familiar on other alternative assessments specifically on portfolio and performance assessments.

Based on the data on the assessment methods used by the Science teachers, performance assessment was one of the most common types of assessment used by the teachers. This could mean that even though the teachers

have been using this type, still a number of them are in need of training in this area. On the other hand, portfolio assessment is commonly used by the teachers based on the result on Table 2. This result could mean that some teachers are willing to gain more knowledge in this area that could eventually be used as one of their assessment methods.

It is notable as well in Table 4 that almost half (74 or 47.74%) of the teachers ranked *test preparation and feedback, others: Testing methods, use of computer applications, all trainings related to testing, etc*, and *test construction and Item writing* as the three (3) lowest in rank. This means that, although they claimed in Table 3 that test preparation and types of questions or test are two (2) of their problems, and it was revealed in Table 1 that they have low competency level in employing the standards of assessment, they are confident that they can still manage, although they need a little reskilling. The results also imply that teachers in Science perceived themselves to be computer literate in their assessment.

These findings suggest the need for comprehensive training programs that address the identified training needs of Science teachers. These programs should cover general assessment principles, current trends in assessment, alternative assessment methods, effective test preparation and feedback, and the integration of technology in assessment. By providing targeted and continuous professional development opportunities, teachers can enhance their assessment competencies, improve their instructional practices, and ultimately contribute to enhanced student learning outcomes.

CONCLUSION

Based on the results of data gathered, the researchers concluded that the public secondary school teachers in Science are generally at a low level of competency on the seven standards of assessment. The most used assessment methods by the teachers are traditional assessments like multiple choice and identification. In addition, most Science teachers use performance assessment and problem solving due to Science's laboratory and Math-based nature. Not so much used methods are cloze tests, e-assessments and portfolio assessment.

It also concluded that the teachers found time for checking and test preparation; students' guessing their answers in the test and low/poor performance; and finding the quality of test via reliability and validity computation as top ranked problems they encounter in doing assessment in their classes. They perceived that they need training along General Assessment, trends in assessment and on alternative assessment.

The low to very level of competency of the teachers in assessment defines the types of assessment methods they use and adds up in the difficulties they encountered in assessing their students' performance in class. The public secondary school teachers are not sophisticated in crafting tests that measure students' abilities aligned to the so called 21st century skills of learners. This scenario clearly shows that there is a need of retooling them in assessment. There is also a need to do curriculum enhancement to TEIs Professional Education courses on assessment to best prepare pre-service teachers on content and pedagogy. According to the Continual Improvement Theory, teachers are determined and motivated to implement changes. The Adult Learning Theory also highlights how adults learn or best respond to learning. Being curious innovators, they are willing to try out new things and discover what works and does not work in their classroom and eventually implement changes to improve their practice.

Recommendations

Based on the forwarded conclusions, the researchers recommend the following actions to address the problems of teachers in assessment and evaluation:

The Science teachers need to attend and participate in seminars and training related to assessment to improve their competence along the seven standards of assessment.

School administrators must consider supporting the Science teachers by allocating funds or budget for continuing professional development of the teachers. They should encourage the teachers to attend training and seminars related to assessment to enhance their knowledge and skills in designing and utilizing assessment tools for assessment. They must also consider the conduct of seminar-workshop/ training in test construction,

test analysis, using alternative assessment like portfolio assessment, and trends in assessment, in order to equip teachers with the knowledge and skills in formulating valid and reliable tests. The conduct of a forum/symposium in measurement, evaluation and assessment in order to invigorate the teachers' role in student assessment is also recommended.

Curriculum developers in Science should consider enhancing the curriculum especially the Professional Education courses on assessment of TEIs by using the results obtained from the study.

A training program could be proposed considering the results of this study and it should be implemented or tried out in the three schools' divisions to test its effectiveness in improving and enhancing the competence of teachers in designing and utilizing assessment tools.

Training coordinators in Science should consider designing seminars and trainings related to assessment to provide teachers the avenue to upgrade their knowledge and skills on assessment. Further, assessment topics should be incorporated in LAC sessions.

Other researchers are recommended to utilize the results of this study. The results could serve as bases for further studies in a wider scope.

It is hoped that with the implementation of the above actions will strengthen and capacitate the teachers with the needed skills and abilities in designing their assessment tools and utilizing assessment strategies, hence, improve students' performance in their subjects.

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