UNIT 7

ASSESSMENT STRATEGIES

Dear student you are welcome to new Unit 7. This Unit is on Assessment Strategies

Indicators:

- Explain why we use varied tools for assessment in Science
- Describe six methods for collecting evidence of Science learning

Activity 1:

- How would you define Assessment in Science?

7.1 Definition/Meaning of Assessment

Assessment has been an integral part of any educational system and has been defined in several ways. Salvia and Ysseldyke (1998) define **assessment** as the collection of information in order to identify problems and make educational decisions. Airasian (1996) sees assessment as the process of collecting, synthesising and interpreting information to aid decision making

Assessment in education generally refers to a process for obtaining and interpreting information that is used for making decision about learners, curricula, programmes and educational policy. A number of decisions made about learner's competence are informed by information derived from assessment data. Therefore, assessing learner's competence, entails collecting information from the learner regarding their progress towards attaining the necessary knowledge, skills, attitudes, or behaviours, which is useful in deciding the degree to which the learner has achieved the performance standards

Assessment within the National Pre-Tertiary Education Curriculum is a coordinated plan for monitoring the academic achievements of learners from Kindergarten through to Senior High Schools in Ghana

Assessment is the **measurement** and **evaluation** of the individual's educational traits, potential and actual performance. The measurement aspect of assessment is the collection of quantitative and qualitative information on an individual through the use of instruments such as tests, assignments and checklist. The evaluation aspects involves making value judgements regarding the status regarding the status of the individual relative to some standards, expectations, other individuals or groups of the individuals and instructional programmes themselves.

On the other hand **measurement** can be said to be processed of collecting data on student performance. **Evaluation** can also be said to be processed whereby the data collected are analysed and compared for value judgement.

No matter what definition is given to assessment, the central issues are that it deals with information gathering, analysing and decision making (Yekple 2005)

Activity 2:

1. What is Testing?
2. State a difference between Assessment and Testing

7.2 Measuring Instrument

There are different measuring instruments for assessment. These include:

Essay and objective tests

In the objective test we have multiple choice, completion test and matching test. Exercises, quizzes, class tests, homework, project work and checklist are examples of instruments used in collecting data.

Types of tests

a. Essay Test
b. Objective Tests
    i. Multiple choice tests
    ii. Short answer tests
    iii. Matching test
    iv. True-False tests

7.2.1 Assessment vs Testing: what's the difference?

Assessment and testing are often used interchangeably. What's the difference between assessment and testing in education? When developing instruction, it's important to know what the difference is between assessment and testing. This article will give the answer, so keep on reading!

7.2.2 What is testing?

What is testing in education? Almost everybody has experienced testing during his or her life. Grammar tests, driving license test etc. A test is used to examine someone's knowledge of something to determine what that person knows or has learned. It measures the level of skill or knowledge that has been reached. An evaluative device or procedure in which a sample of an examinee's behaviour in a specified domain is obtained and subsequently evaluated and scored using a standardized process (The Standards for Educational and Psychological Testing, 1999)

So, what's the difference?

Test and assessment are used interchangeably, but they do mean something different. A test is a "product" that measures a particular behaviour or set of objectives. Meanwhile assessment is seen as a procedure instead of a product. Assessment is used during and after the instruction has taken place. After you've received the results of your assessment, you can interpret the results and in case needed alter the instruction. Tests are done after the instruction has taken place, it's a way to complete the instruction and get the results. The results of the tests don't have to be interpreted, unlike assessment.

Activity 3:

1. What is evaluation?
2. Identify any two **(2)** differences between Assessment and Evaluation.

7.3 Relationship between Assessment and Evaluation

Besides the differences, there are also some similarities between assessment and evaluation. The both require criteria, use measures and are evidence-driven.

Difference between assessment and evaluation?

Assessment	**Evaluation**
Is on-going	Provides closure
Improves learning quality	Judges learning level
Individualized	Applied against standards
Ungraded	Graded
Provides feedback	Shows shortfalls
Process-oriented	Product-oriented

Activity 4:

- Discuss any five **(5)** Principles of Assessment in Science

7.4 Principles of Assessment

The following principles should guide assessment approaches:

1. **Test developer must be clear about the performance indicators to be assessed:** This involves clearly specifying the intended learning goals and selecting the appropriate assessment techniques, which should be clear, explicit and accessible to all stakeholders, including learners.
2. **The assessment technique selected must match performance indicators:** The main criterion is whether the procedure is the most effective in measuring learning within the performance indicators. Assessment tasks should primarily reflect the nature of the discipline or subject and should also ensure that learners have the opportunity to develop a range of generic skills and capabilities.
3. **Assessment techniques must serve the needs of the learners:** They should provide meaningful feedback to the learners about how closely they are meeting the demands of the

performance indicators. Timely feedback promotes learning and facilities improvement and should be an integral part of the assessment process.

4. **Assessment is a goal-oriented process:** The assessment task should match the purpose of the subject being assessed. It works best when the programme being assessed has a clear, explicitly stated purpose.
5. **Good assessments use multiple methods:** Multiple indicators of performance provide a better assessment of the extent to which a learner has attained a given learning target. Assessment needs to be comprehensive. Formative and summative assessment should be incorporated into the programmes to ensure that the purposes of assessment are adequately addressed.
6. **Assessment is inherently a process of professional judgment:** Proper use of assessment procedures requires that the user is aware of the limitations of each technique. In interpreting the results of the assessment, these limitations must be considered. Therefore, all those involved in the assessment of learners must be competent to undertake their roles and responsibilities.
7. **Assessment is a means to an end:** It is not an end in itself but a vehicle for educational improvement. Assessment influences learners' motivation for learning. The nature of assessment influences what is learned and the degree of meaningful engagement by learners in the learning process, learners are, therefore, entitled to feedback on submitted formative assessment tasks and on summative tasks, where appropriate.
8. **Assessment should be valid and reliable:** Evidence needs to be provided that the interpretation and use of learners' assessment result are appropriate and reliable. For assessment to be reliable, it requires clear and consistent processes for setting, marking, grading and moderating assignments/tests.
9. **Good assessment appropriately incorporates technology:** As technology advances and teachers become more proficient in the use of technology, there will be increased opportunities for teachers and district and regional education directorates to use computer based techniques (e.g. item banks, electronic grading, computer-adapted testing and computer based simulations)
10. **Good assessment is fair and ethical:** Usually, four view of fairness are presented by the Assessment Standards as:
    i. Absence of bias (e.g. offensiveness and unfair penalization)
    ii. Equitable treatment
    iii. Equality in outcomes
    iv. Opportunity to learn

Activity 5:

- State and explain any four **(4)** importance of classroom assessment.

7.5 Purposes and Uses of Classroom Assessment

1. To motivate learners to improve their work.
2. To advise learners on how to direct their learning efforts.
3. To advise individuals on their vocational choices.
4. To screen or select individuals for admission, promotion, certification and other honours.
5. To determine the effectiveness of instructional methods and materials

6. To discover individual problems and weaknesses
7. To determine how to group students for instruction in view of individual differences.
8. To determine the progress of each individual.
9. To determine the extent to which instructional goals are being achieved.

7.6 Types of Assessment

Assessment types are varied. They are diagnostic assessment, formative assessment and summative assessment.

Activity 6:
- What is Diagnostic Assessment?

7.6.1 Diagnostic Assessment

Diagnostic assessment is useful in identifying learners' current knowledge and skills and abilities and helps to clarify misconception prior to introducing learners to a new learning area. The information gathered from a diagnostic is essential or better planning of what is to be taught and how to teach it. Diagnostic assessment may take the form of pre-test of learners' knowledge and ability in a given content standards and performance indicator. It can also take the form of self-assessment against core competencies for the purpose of identifying areas of strength and weakness. Use of short interview of 10 minutes or less is another way to undertake a diagnostic assessment.

Activity 7:
- What is Formative Assessment?

7.6.2 Formative Assessment

Formative assessment provides feedback and information during a teaching and learning process. Formative assessment measures learners' progress and in a way assesses the teachers' own progress of delivering the content in a manner that ensures learning is taking place. Primarily, formative assessment focuses on identifying areas of learning that may need improvement. In order for it to serve this purpose, formative assessments are not normally graded and instead feedback is provided to enable the learner know their learning progression and to determine the effectiveness of lesson delivery by the teacher – whether the method and activities being used are appropriate.

Formative assessment in Ghana's classroom should include:

- Observations during in-class activities.
- Homework exercises as a review of class discussion and signal for further teaching and learning activities.
- Reflections journals that are reviewed periodically during the term.
- Question and answer sessions, both formal (planned) and informal (spontaneous).

- Progress review meetings between the teachers and students at various points in the term.
- In-class activities where learners informally present their results.

Activity 8:

- Identify a difference between **Assessment for Learning** and **Assessment as Learning.**

Assessment for Learning

The use of formative Ghanaian classrooms should be understood as Assessment for Learning (AfL), an assessment practice that describes approaches within the formative purposes of assessment. (AfL) is the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learner is in their learning, where they need to be (the desired goal), and how best to get there. AfL is one of the powerful methods for improving learning and raising standards (Black and William 1998)

Assessment for Learning also refers to all those activities undertaken by teachers and/or by their learners, which provides information to be used as feedback to modify the teaching and learning activities in which they are engaged' (Black and William, 1998). AfL can be achieved through processes such as sharing criteria with learners, effective questioning, and feedback.

Assessment as Learning

Assessment as learning relates to engaging learners to reflect on the expectations of their learning. Information that learners provided the teacher forms the basis for refining teaching-learning strategies. Learners are assisted to play their roles and to take responsibility of their own learning to improve performance. Learners are assisted to set their own goals and monitor their progress

Activity 9:

- What is Summative Assessment?

7.6.3 Summative Assessment

Summative assessment is an assessment usually conducted but not always, at the end of the school year based on the accumulation of the progress and achievements of the learner throughout the year in a given subject, together with any end-of-year test or examinations. Summative assessment demonstrates the extent of a learner's success in meeting the assessment criteria used to gauge the intended learning outcomes, and which contributes to the final mark given for the learning area within the content standards. The result of summative assessment is a single end-of-year promotion grade. Summative assessment captures a record of learning at the end of a period of study. However, formative and summative assessments are not in opposition; they are interrelated and complementary. The information from formative assessment, supplemented by class tests or tasks, helps to ensure dependable summative assessment.

Activity 10:

- How would you explain Assessment of Learning?

Assessment of Learning

Assessment of Learning (AoL) is carried out purposely for grading and reporting. AoL involves decision about the merits of learner performance in relation to standards of performance. It is designed to measure student achievement and gauge what they have learned. AoL take place at a point in time for summarising the status of student achievement. It occurs at the end of the learning unit. AoL has well established guidelines that include:

- A number or letter grade (summative)
- Comparing a learner's achievement with the standards.
- Communicating results to learners and parents, where necessary.

Activity 11:

- Explain how to use Assessment "for", "as" and "of" learning to teach a Science lesson

7.7 Illustration of how to use Assessment "for", "as" and "of" learning to teach a lesson

<table>
<tr><th>Indicator</th><th>Assessment for learning</th><th>Assessment as learning</th><th>Assessment of learning</th></tr>
<tr><td>B 2. 1. 2. 3. 1 Describe a solid-solid mixture and explain how to separate the component</td><td>In the course of the lesson: identify the solid-solid mixtures among the following: gari, and water, sand and salt, charcoal and sand, iron nails in water</td><td>Before the lesson: find-out from the home, how sand is separated from roasted groundnut.
Let learners share ideas in group discussion</td><td>End of term: Explain how you would separate a mixture of sand and stone</td></tr>
<tr><td>B 3. 3. 3. 1. 1 Identify organisms in a habitat and describe why they live in a particular place</td><td>During the lesson: Match the following animals with their home/habitat
<table><tr><th>Habitat</th><th>Animal</th></tr><tr><td>• River
• Tree Top
• Hole in the ground</td><td>• Bird
• Rat
• tilapia</td></tr></table></td><td>During the lesson introduction: Discuss among yourselves: in your community , where do you normally see birds building their homes</td><td>End of Unit Exercise: what enables fish to live in water?</td></tr>
</table>

Activity 12:

- What is Self-Assessment?

7.8 Self-Assessment

The goal of implementing self-assessment in a course is to enable students to develop their own judgement. In self-assessment students are expected to assess both process and product of their learning. While the assessment of the product is often the task of the instructor, implementing student assessment in the classroom encourages students to evaluate their own work as well as the process that led them to the final outcome. Moreover, self-assessment facilitates a sense of ownership of one's learning and can lead to greater investment by the student. It enables students to develop transferable skills in other areas of learning that involve group projects and teamwork, critical thinking and problem-solving, as well as leadership roles in the teaching and learning process.

Things to Keep in Mind about Self-Assessment

1. Self-assessment is different from self-grading. According to Brown and Knight, "Self-assessment involves the use of evaluative processes in which judgement is involved, where self-grading is the marking of one's own work against a set of criteria and potential outcomes provided by a third person, usually the [instructor]." (Pg. 52)
2. Students may initially resist attempts to involve them in the assessment process. This is usually due to insecurities or lack of confidence in their ability to objectively evaluate their own work. Brown and Knight note, however, that when students are asked to evaluate their work, frequently student-determined outcomes are very similar to those of instructors, particularly when the criteria and expectations have been made explicit in advance.
3. Methods of self-assessment vary widely and can be as eclectic as the instructor. Common forms of self-assessment include the portfolio, reflection logs, instructor-student interviews, learner diaries and dialog journals, and the like.

Activity 13:

- What is Peer Assessment?

7.9 Peer Assessment

Peer assessment is a type of collaborative learning technique where students evaluate the work of their peers and have their own evaluated by peers. This dimension of assessment is significantly grounded in theoretical approaches to active learning and adult learning. Like self-assessment, peer assessment gives learners ownership of learning and focuses on the process of learning as students are able to "share with one another the experiences that they have undertaken." (Brown and Knight, 1994, pg. 52)

Things to Keep in Mind about Peer Assessment

1. Students can use peer assessment as a tactic of antagonism or conflict with other students by giving unmerited low evaluations. Conversely, students can also provide overly favourable evaluations of their friends.
2. Students can occasionally apply unsophisticated judgements to their peers. For example, students who are boisterous and loquacious may receive higher grades than those who are quieter, reserved, and shy.
3. Instructors should implement systems of evaluation in order to ensure valid peer assessment is based on *evidence* and *identifiable criteria*.

UNIT 7: SUMMARY

This unit discusses the following sub-topics:

7.1 Definition/Meaning of Assessment
7.2 Measuring Instrument
7.3 Relationship between Assessment and Evaluation
7.4 Principles of Assessment
7.5 Purposes and Uses of Classroom Assessment
7.6 Types of Assessment
7.7 Illustration of how to use Assessment “for”, “as” and “of” learning to teach a lesson
7.8 Self-Assessment
7.9 Peer Assessment