

## Students' Assessment Procedures in the Agricultural Education Undergraduate Program: The Botswana College of Agriculture Experience

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**Abstract:** The purpose of the study was to describe through the review of relevant literature sources the undergraduate BSC degree program in agricultural education and the level and students' assessment procedures in the Botswana College of Agriculture. The findings show that the Botswana College of Agriculture offers core, optional and general education courses in the agricultural education undergraduate BSC degree program that are relevant to the socio-economic development needs of Botswana. The college also uses a variety of procedures for assessing students achievement in the program by: (1) having a balanced curriculum that clearly specifies testing and assessment procedures and strategies, (2) making assessment and testing procedures consistent with the objectives of the program and course offered, (3) having a variety of tests to allow for a range of different learning outcomes to be assessed, (4) setting a detailed, justifiable and transparent criteria for assessment, and (5) minimizing the number of tests and assessment as the college considers too much assessment and testing to be counter productive. The study recommended that agricultural educators maximize stakeholders' involvement in the development of the assessment plans that reflect the uniqueness of the program, national education policies, vision and mission.

**Key words:** Agricultural education, Botswana College of Agriculture Experience, procedures, students' assessment and Undergraduate Degree Program

### INTRODUCTION

Student learning and performance in Botswana College of Agriculture (BCA), like in other agricultural education institutions ride on the relevance and validity of testing and assessment procedures and practices in agricultural education programs. Valid agricultural education programs make testing and learning assessment an ongoing part of training and a fundamental ongoing part of students' preparation for the world of work in agricultural or related professions (Kulieke *et al.*, 1990; BCA Prospectus, 2008/2009; James *et al.*, 2002). By focusing training, learning, testing and assessment in agricultural education on students' needs, educators align their human capital with the future of success in the students' chosen agricultural careers. In this way, assessment procedures provide the measures by which agricultural educators define success in the programs and the method by which they achieve it (McCormick, 1984). Agricultural education institutions that have made testing and assessment an integral part of student learning and development, and a part of their core value system, appreciate the principal worth of quality student performance. The impact of "good" assessment and testing matures the agricultural education program and helps propel the potential for the students being trained (Squire, 1999; Nickell, 1993; Burger, 2004).

The word "assessment" in agricultural education is often used to describe the process of determining what

students know and how well they can apply what they have learnt in theory and in real life situations. Assessment involves making a judgment. Agriculture Educators rely on a variety of tools, including tests, homework, participation, projects, and other indicators to make assessments (Burger, 2004).

Many agricultural education institutions are designing and using innovative assessment strategies some of which are called authentic assessment, performance-based assessment, portfolio assessment, process assessment, exhibits, demonstrations, and profiles. Regardless of the label, each of these techniques has moved beyond the concept of measuring student learning using multiple choice and other simple tests as a single measure of student learning at one point in time (Kulieke *et al.*, 1990).

An effective program to assess student academic achievement in agricultural education must flow from the institutions mission and educational purposes; emerge from a conceptual framework; and require faculty ownership and responsibility since the faculty members, more than any anyone else, are directly involved in the process of students' learning. The program must also:

- have institution-wide support and use multiple testing measures, both qualitative as well as quantitative, rather than relying on one instrument or activity
- provide feedback to students, educators, parents, the institution and be cost effective, and sustainable

- not restrict or inhibit goals of access, equity, and diversity established by the institution
- lead to improvement and be seen as a means rather than an end
- must include a process for evaluating the assessment program (Anonymous, 2009a; Botswana College of Agriculture, 2008/2009).

An effective plan for assessing student learning in agricultural education programs should therefore:

- determine educational/programmatic goals and objectives for the program
- identify and describe the instruments or methods for assessing student achievement
- determine how the results will be disseminated and used for program improvement
- develop a timetable for accomplishing the previous three steps, with each academic unit ensuring the need to establish a schedule for selecting, implementing, and using the results of the assessment strategies
- submit assessment objectives, methods, and timetable to the institution's programs' planning unit
- implement assessment plans and revise as needed. The six steps approach provide effective plans for assessing student learning, gives widespread ownership of assessment planning to agricultural educators and enables them to determine the methods and instruments that are most applicable to their educational objectives (Anonymous, 2009b; Kulieke *et al.*, 1990).

The six steps assessment plan approach however requires an educational environment where instruction and assessment are integrated and where assessment is not considered to be a single event. The concept of dynamism as an active process in which students and teachers participate provides a model for new assessment techniques that are aligned with the new vision for teaching and learning. The segments of the six steps approach reflect continuing belief in the importance of assessment for accountability, program and curriculum improvement, and feedback to parents, teachers, and students (Kulieke *et al.*, 1990).

The purpose of each assessment step should be directly related to decisions about students, the curriculum and the institution's resources. Those decisions, in turn, are related to decisions about the educational programs in the agricultural education and extension institutions that include:

- **Diagnosis:** Monitoring students' strengths, weaknesses, and progress in specific areas
- **Placement:** Matching students to appropriate levels
- **Guidance and counseling:** Helping students to make appropriate educational and vocational decisions

- **Admissions:** Choosing students to be admitted into various programs
- **Certification:** Determining mastery of specified criteria. Some decisions made about educational programs are:
  - **Evaluation:** Judging the value and effectiveness of instructional programs and delivery systems
  - **Accountability:** Reporting results to specific publics
  - **Research planning:** Identifying educational areas requiring further study (Kulieke *et al.*, 1990; Nickell, 1993; Mojit *et al.*, 2004; Seaford, 1991; Worthen and Sanders, 1988).

**Purpose and objectives:** The purpose of the study was to describe the BSC agricultural degree program and the assessment procedures in the Botswana College of Agriculture, University of Botswana. The objectives were to:

- Describe the undergraduate agricultural education degree program
- Describe the procedures for students' assessment
- Explain the procedures used to ensure quality assurance in students' testing and assessment at the college

## RESULTS AND DISCUSSION

This paper is based on related literature review and the experiences of the author as a life long agricultural educator in African countries. Detailed Internet, library and other databased searches were used resulting in obtaining information that focuses on assessment of educational outcomes in agricultural education at the Botswana College of Agriculture. The experiences of the author in assessing students' learning in agricultural education were also incorporated in the conclusion and recommendations made.

The BSC degree program in agriculture education at the Botswana College of Agriculture is a single major degree program. The program focuses on the skills, knowledge and the right types of attitudes, needed for successful leadership and professional positions in agriculture teaching and management. Although the program is primarily designed to prepare secondary teachers of agriculture, the knowledge, skills and attitudes students develop in this program are transferable to any career in which communication and leadership skills; and technical knowledge and skills about and in agriculture are important. The agricultural education program in the college encompasses courses in many specialized professions including core, general education and optional courses (Botswana College of Agriculture, 2008/2009). The study generated many useful parameters that describe agricultural education assessment procedures in agricultural institutions. For the purposes of this study

however, the results discuss only issues that deal specifically with the study objectives.

**Students’ assessment in agricultural education program:** Assessment of students in the BSC agricultural education program is done at five levels:

**Continuous assessment (CA):** Continuous Assessment of students in the BSC agricultural education program is a strategy implemented by the college as a matter of academic policy in order to determine whether the students have mastered the knowledge and skills they are taught. The CA grade for each course accounts for 50 percent of the Final Grade (FG) at the end of each semester. The academic staff assesses for CA in a variety of ways including assignments, tests, projects, practical, and quizzes during the semester. Students receive feedback from their lecturers/professors based on their performance. The Continuous assessment is a powerful diagnostic tool that enables the students to understand the areas in which they are having problems and concentrate their efforts in those areas. The CA also allows the lecturers/professors to monitor the impact of their teaching on the students’ understanding and application of skills to enhance the modification of their pedagogical strategies. The professors/lecturers also use the CA assessment outcomes to assist the students through remedial or tutorial programs. In this way, the results of the CA help ensure that all students in the program progress in their learning throughout the semester or the academic year.

**Final examination:** Final Examination (FE) for undergraduate programs at the Botswana College of Agriculture is administered at the end of each semester in all courses offered during the semester. It comprises a set of questions including essays, multiple choice, and short answer questions. In some courses, practical examinations are administered at the end of the semester to fulfill the requirements for the FE. The FE accounts for 50 percent of the Final Grade for each course taught and examined. Grades for each course are interpreted based on the data in Table 1.

**Teaching practice:** Students enrolled in the undergraduate agricultural education degree program are required to complete six weeks of Supervised Teaching Practice Course in winter in secondary schools. In order to qualify for Teaching Practice the student must have taken and passed all core and optional courses in levels 100 and 200 in the BSC agricultural education curriculum. The teaching practice course is graded on a pass or fail bases. A pass grade in the teaching practice course is a requirement for graduation. Agricultural Education Lecturers and Professors are required to

Table 1: Interpretation of Grades in Examinations

Marks	Letter grade	Grade point	Letter grade interpretation
80-100	A	5.0	A = Outstanding
75-79.9	B+	4.5	B+ = Excellent
70-74.9	B	4.0	B = Very Good
65-69.9	B-	3.5	B- = Good
60-64.9	C+	3.0	C+ = Satisfactory
55-59.9	C	2.5	C = Pass
50-54.9	C-	2.0	C- = Marginal Pass
45-49.9	D+	1.5	D+ = Marginal
40-44.9	D	1.0	D = Marginal Fail
35-39.9	D-	0.5	D- = Fail
0-34.9	E	0.0	E = Fail (Zero Grade)
			I = Incomplete
			X = Absent
			AUD Audit Course. No Credit granted
			YL. Year long course Eg. year long Project

Source: Botswana College of Agriculture Prospectus (2008/2009)

supervise and grade each student’s teaching three times during the teaching practice period.

A school’s cooperating teacher assists the student teachers to gain confidence in their teaching. The cooperating teacher also supervises and assesses the students teaching and writes confidential report to the College Teaching Practice Coordinator about the students’ professional performance and behavior during the teaching practice period. The teacher’s report, with the approval of the school headmaster is used by the teaching practice coordinator at the college to make recommendations to the Departmental Board about a student’s capability to be certified as an agriculture teacher. An average grade of the college’s lecturers/professors’ grades and those of the cooperating teacher constitute a students grade for the Teaching Practice Course. An average grade of 49% or below is a fail grade while an average grade of 50% or above is a pass grade in teaching practice.

**Field Practical training:** In addition to the teaching Practice course, students enrolled in the undergraduate BSC agricultural education program are required to complete a six-week Field Practical Training (FPT) as a winter course, between levels 300 and 4000. In order to qualify for the FPT, the student must have taken and passed all core and optional courses in levels 1000 to 3000. Students are placed in farms that the Field Practical Training Committee have assessed and found suitable for practical training.

**Students project:** Students enrolled in the agricultural education degree program are required to complete a project. Each student is supervised by a lecturer/professor or in some situations students are co-supervised. Some students enrolled in the agricultural education program normally conduct surveys, Correlational, causal comparative and historical research studies. Other students do experimental projects in crop and animal sciences, agricultural engineering and basic sciences under the supervision of lecturers/professors in their identified research projects.

**Interpretation of grades in examinations:** Overall performance of students in a course is assessed on a percentage scale, a letter grade, and a grade point as described in Table 1. Departmental and Faculty Boards take academic decisions affecting students based on the marks letter grades and grade points students attain in each course at the end of each semester.

**Procedures to ensure quality assurance in students' assessment:**

**Moderation of test/examination instruments and scripts:** All tests and assessment procedures are approved by the University of Botswana Senate. Internal moderators appointed by each academic department moderate all forms of examinations or tests before they are administered to students. Assessment of scripts is based on a marking scheme and model answers that are approved by the internal departmental moderators. After the internal examiner assesses the scripts and assigns grades based on the marking scheme and model answers, the Departmental Examinations Coordinator forwards the scripts to the internal moderators, normally at the level of senior lecturer or higher, for moderation of the grades. The internal moderators may make minor or major adjustments to the internal examiners grades, which become the final grade for each student for a particular course.

**Approval of course grades:** All the course grades moderated by internal moderators are subject to scrutiny and approval by the Departmental Board. All internal examiners present their moderated course grades to the Departmental Board in a meeting of all academic staff. The Departmental Examinations Coordinator summarizes a summary of all grades for all courses after the departmental Board's approval of the grades. The Head of Department presents the summary of the grades for all courses to the Faculty Board for approval. This is followed by University Senate's approval of the grades presented by the Dean of the Faculty before the grades are published.

### CONCLUSION AND RECOMMENDATION

There is no one "right" or "good" way to assess students learning because assessment procedures and strategies in agricultural education programs are based on specific purposes and specific population characteristics and needs. What is required to meet the objectives of any form of assessment in agricultural education is to:

- have a balanced curriculum that clearly specifies the assessment procedures and strategies
- make assessment and testing procedures consistent with the objectives of the course

- have a variety of tests to allow for a range of different learning outcomes to be assessed
- set a detailed, justifiable and transparent criteria for assessment
- minimize the number of tests and assessment as too much assessment and testing may be counter productive

Agriculture educators must also shift from:

- testing to multiple assessments
- from lower to higher cognitive levels of testing and assessing students' range of abilities and talents
- from assessments of one or two dimensions to multidimensional assessments
- from testing as an isolated event to assessment as an integral part of instruction (Kulieke *et al.*, 1990; Nickell, 1993; Bloom *et al.*, 1956).

The study has also shown that agricultural educators can use a milieu of appropriate pedagogical skills and administrative procedures to:

- eliminate in the test design construct-irrelevant factors that can promote subjectivity and inhibit student performance in assessment and testing
- incorporate higher-level cognitive skills in testing and assessment to enhance the capability of the graduates of the program to make informed decisions; solve problems, and acquire, synthesize, and communicate useful information and ideas to their clients (Lam, 1995; Squire, 2000).

The success of students' assessment program is however dependent on the maximization of stakeholders' involvement in the development of the assessment plans that reflect the uniqueness of the program, national education policies, visions and missions.

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