

# **Evaluating learning objectives and expected student learning outcomes through the analyses of written examinations. A Case Study in the University of Papua New Guinea Open College.**

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## **Abstract**

*Examination(s) is one important instrument for assessing students' learning outcomes. In order to assert quality assurance on examinations, periodic evaluation and analysis of examinations should be a must to assess its effectiveness to determine the degree of learning outcomes in comparison to the designed outcomes. Experience shows that the instruments employed to test the expected student learning outcomes are not evenly distributed and often inconsistent.*

*This preliminary study was directed at evaluating the written examinations of the Certificate in Tertiary and Community Studies (CTCS) courses of the University of Papua New Guinea Open College (UPNG OC). The written examinations were evaluated according to the Characteristics of a Good Test (Thanulingom, 2007) by confirming the presence and absence of the Learning Objectives (LOs) and Expected Student Learning Outcomes (ESLOs) assessed in these final examinations. The study identified discrepancies between the expected and actual outcomes in a course and it is assumed that these discrepancies are consistent in all CTCS courses due to the design of the assessment instruments. The findings of this study will be used for designing a conclusive study and planning effective methods of designing written examinations in the open and distance learning systems.*

## **Introduction**

In the last decade distance education has reached an extraordinary growth with the advent of rapid development in Information Communication Technology (ICT) to accommodate for the increasing demand for education and training. Though there are existing academic debates on the learning experience in both modes of delivering learning, most ODL providers have chosen to promote quality assurance as an important tool for building public confidence. It has been a practice to develop quality assurance toolkits to guide institutions' development of their quality assurance policies, yet Upot (2005) argues that; 'there is no single definitive method of ensuring quality, especially in the context of distance education'. Specific quality assurance strategy is not universally adoptable since distance education 'outfits' varies widely from institution to institution and one country to another. Thus the pace of development and process of maintenance of quality assurance on open and distance learning must be flexible to the extent of practices without prescriptions.

Therefore, a suitable and practicable quality assurance policy would evolve with the stages of institutional development in order to ensure the consideration of the learner and practitioners' experience. It is therefore important to formulate quality assurance policy along with the implementation of various functions of the ODL institution rather than developing a quality

assurance policy beforehand. 'What is required essentially is to keep the quality concept in mind while developing and implementing systems, process, and procedures' (Mannan.2009). The University of Papua New Guinea Open College (UPNG OC) did not formulate a quality assurance policy during its establishment period but the quality assurance evolved with its development. The formulation of work instructions, benchmarks and aspirations are taking place at later stages of its establishment based on the learners and institutional experience. Upon this context the UPNG OC has taken an evolutionary approach towards developing and implementing a quality assurance policy. This paper seeks to assert the ongoing endeavour of individual staffs towards ensuring quality assurance at all levels of development and practice within the UPNG OC. Thus this is a case study that presents an Institution's strife to establish an evaluative approach towards asserting quality assurance with respect to the design of written examinations of the Certificate in Tertiary & Community Studies (CTCS) courses and programme within the UPNG OC.

### **Objectives of the Study**

The Case Study was conducted to examine and evaluate various designs of written examinations over a period of 4 years (2007 – 2010) for a CTCS course (Numeracy 3) and the main objectives of this study were;

1. to find out if the tests fulfil all the Characteristics of a Good Test (Thanulingom.2007) and are they useful for research purposes,
2. to examine if the design of the written examinations were adequate in testing the learning objectives and the expected student learning outcomes,
3. to assess whether this approach of analysing written examinations can be employed for systematic or periodic informative evaluations for review of curriculum contents.

### **Background to the Case Study**

Assessment is an important process of finding out what learning experience students have achieved as a result of the process of teaching. It seeks to find answers to the questions: (i) in what ways are students different and (ii) how much change has taken place in students? Students' achievement of the aims and objectives set for them in courses or programmes are assessed and it helps to evaluate or judge how effective teaching has been and recommend ways to improve teaching and learning. This represents the normal scenario in classroom based teaching and should also be the norm in open and distance learning (ODL). At present UPNG Open College has two main assessments that it assesses students' achievements or competencies. The formative assessment and the summative assessment. The formative assessment provides continuous feedback to both teachers and students, which they can use to monitor and guide their progress yet as opposed to the ODL mode of delivering learning experience this, has more or less been untimely or the feedback is none at all. A written examination makes up the summative assessment which is administered at the end of the course. Thus confirms what Mehta and Saxena (2003) observed; 'we have changed the way we provide education but we haven't changed the way in which we assess the students'.

Open and Distance Learning Systems (ODLS) welcomes and adopts innovations in the system, such a statement gives cause to action. Summative assessments especially written

examinations do not have formative value. Mehta and Saxena (2003) argues, ‘most students develop the tendency to pass the exam by any means, it is pertinent to mention that not all students can be assessed using the same instrument. In the context of ODLS it is even more important, since ODL students form a heterogeneous group with respect to their experiences, background, learning styles, and socio – economic – cultural – geographic – demographic origins’. Nightingale, P. et.al. (1996), earlier in the 90s looked at ways where summative assessments can be made formative to ensure that students take formative tasks seriously while Shepard (2000) emphasised the role of classroom assessment, vindicating its formative value within the conventional mode.

This paper on the other hand seeks to assert the written examinations’ value in the context of ODLS more specifically with respect to its potential as a resource. It is assumed that if the written examinations are analysed and evaluated in terms of the errors the students have committed in understanding concepts as well as to ensuring whether they have achieved the desired learning outcomes. This information can be used for planning future work with students and in developing more effective teaching and learning strategies for specific courses. The underlying principle is that the assessment tasks should comprise a genuine representation of the objectives of the course or unit.

## **Method of Study**

There are two sole reasons why this study was conducted. The first reason is associated with the initial design and development phase of the learning materials. The development of all print based learning materials here in the UPNG Open College is guided by the ADDIE (Analyse, Design, Develop, Implement and Evaluate) model in principle. And so it is assumed that all learning materials are designed and developed accordingly which implies that course designing should be focused at best upon the students learning needs rather than a generalized view and so courses are therefore designed upon the later criterion.

The second reason for this study is that reviews are based entirely on the Reviewers’ perceptions or opinions on what should be reviewed again without the involvement of all stakeholders affected by the product thus the review materials may be dubious. It is a setback when the questionnaires for course evaluations are not returned and then again the responses are impossible to validate even so for the case with interviews therefore this paper seeks to analyse and evaluate the old exam papers to provide information about the students’ learning needs and achievements or the their mastery over the concepts asked in the examination scripts.

## **Numeracy 3**

Numeracy 3 is a course in the UPNG Open College CTCS Numeracy programme that provides numeracy skills for the CTCS learners. It is delivered as a package that consists of a Study Guide and a Course Outline.

The Study Guide contains the learning objectives, practice activities with solutions and serves as the sole medium in which learning experiences are delivered. It contains in total 10 Units and 41 Learning Objectives (LO).

The Course Outline provides the Learner the support he/she needs to successfully complete his/her studies, in terms of course advising, drawing up personal study schedules, how to contact course coordinators and whom, and for Examination practice; a practice examination paper with solutions is also a main feature of this resource/learning material among others. The Expected Student Learning Outcomes (ESLO); five of them are found here also.

### **Presence and Absence of Learning Objectives and Expected Student Learning Outcomes**

The assessment design were evaluated if they satisfied all the Characteristics of a Good Test (Thanulingom, 2007) by confirming the presence and absence of the Learning Objectives (LOs) and Expected Student Learning Outcomes (ESLOs) being assessed in these written examinations. The characteristics of tests for research purposes should possess the following;

- **Reliability:** a reliable test is a trustworthy tool. A good test must measure accurately and consistently.
- **Validity:** it must actually measure what it is supposed to measure.
- **Objectivity:** it must be objective. It is an important factor that affects both the validity and reliability of a test.
- **Discrimination:** the test must detect and measure small differences in achievement, intelligence and the like. Each item of the test should discriminate between good and poor students if the test is used in educational research.
- **Comprehensiveness:** a test should be comprehensive enough to be valid. It should include enough material so that it measures what it is supposed to measure.
- **Usability:** before using any test, the investigator should make sure whether he needs to collect the data related to the ability which that particular test measures.

The above is the characteristics that were used to evaluate the design of the tests against the characteristics listed above and it was conducted in this particular manner;

**Step 1:** involved establishing the total number of LOs and ESLOs contained in the course. There are in total 41 LOs and 5 ESLOs.

**Step 2:** A matrix was drawn and LOs inherently tied to or associated with 1 of the 5 ESLOs were identified and grouped. The skills pertaining to each ESLOs are as follows;

**ESLO 1** – skills needed to solve problems related to percentages, business transaction, simple and compound interest;

- ESLO 2** – skills to factor more complex algebraic expressions and apply the laws of indices;
- ESLO 3** – skills to solve linear and quadratic equations, using various techniques;
- ESLO 4** – basic skills in statistics and understanding the relationship between statistics and probability;
- ESLO 5** – able to determine the probability of various theoretical events.

**Step 3:** The total number of LOs tested were counted in each of the written examination from Semester 1 and 2 of 2007 through to Semester 1 of 2010. And then the numbers of ESLOs also were established for each Semester.

**Step 4:** And finally the number of questions allocated for each ESLOs were established (see Table 1).

## Results and Discussion

The study found that questions (items) employed to test the expected student learning outcomes were not evenly distributed with respect to testing each specific ESLOs (Table 1). For instance; ESLO 1 has been allocated over the period between 2007 to 2010 on average eight questions per semester, while ESLO 2 and 3; twelve and fifteen respectively whilst ESLO 4 only four questions. And ESLO 5 on average five per Semester. Furthermore some expected student learning outcomes were not being assessed (Table 1). For instance in Semester 2 of 2007 three ESLOs (1, 4 and 5) were not assessed except ESLOs 2 and 3. Coupled with that there were eight generic questions in the Semester 2 of 2007 Final Examination that was not appropriate and consistent with the expected student learning outcomes to be assessed;

**Table 1:** Shows the number of ESLO being tested and the number of questions (inclusive of sub – questions) allocated to each ESLO in the 1<sup>st</sup> and 2<sup>nd</sup> Semester from 2007 – 2010.

ESLO	Frequency of questions per/Sem/Year							
	2007		2008		2009		2010	Average
	S1	S2	S1	S2	S1	S2	S1	
<b>1</b>	5	0	7	7	11	16	11	<b>8</b>
<b>2</b>	9	19	14	8	6	18	13	<b>12</b>
<b>3</b>	8	25	17	23	11	10	8	<b>15</b>
<b>4</b>	6	0	5	5	0	2	8	<b>4</b>
<b>5</b>	8	0	8	9	10	0	0	<b>5</b>
<b>Average</b>	<b>7</b>	<b>9</b>	<b>10</b>	<b>10</b>	<b>8</b>	<b>9</b>	<b>8</b>	<b>9</b>

The number of Learning Objectives (LOs) tied to these ESLOs was on average 62% but for each semester it ranged from as low as 34% to 78% (Table 2). The lowest was in Semester 1 of 2009 (34%) although it tested four ESLOs there were only 14 LOs represented in the test.

**Table 2:** Shows the number of Learning Outcomes (LOs) and Expected Student Learning Outcomes (ESLOs) tested in a Semester per year over a 4 year period. Semester 1 and 2 of the year 2008 had the highest percentage of LOs and ESLOs tested; respectively 78% and 100%.

		Total number of LOs and ESLOs Tested per Semester per Year							
		2007		2008		2009		2010	Average/Sem/Year
		S1	S2	S1	S2	S1	S2	S1	
<b>LOs Tested</b>	<b>Freq.</b>	26	18	32	32	14	26	30	26
	<b>%</b>	63	44	78	78	34	63	73	62
<b>ESLOs Tested</b>	<b>Freq.</b>	4	2	5	5	4	4	4	4
	<b>%</b>	80	50	100	100	80	80	80	80

The results confirm that these tests do not satisfy all the Characteristics of a Good Test. Nightingale (1996) argues that good assessment practices allows teachers to demonstrate the quality of their students' learning to others (meeting demands for accountability) and, more importantly, because we are convinced - from our own experience as teachers, as advisors of teachers, as scholars of student learning and as researchers in higher education – that there is nothing more likely to undermine teachers' objectives than ill – conceived assessment tasks. While every effort will be made to ensure that assessment methods are as valid and reliable as possible, it must be recognised that human judgment is a significant element in indicators of achievement. Thus according to the University of Papua New Guinea Undergraduate Assessment and Accreditation Policy (2006) it has chosen to seek moderation (including external moderation where appropriate) in the setting of assessment tasks and of marking in order to improve the validity and reliability of assessment processes.

Although this is convenient as it is this study point towards the need to look at student – evaluation differently from the point of view of educational outcomes. Thus evaluation of students must be multi – level and support continuous improvement of methodology to achieve the learning objectives (Mehta and Saxena. 2003). Moreover, if students are to be tested simply to establish criteria for assigning grades and communicating institutional accountability, many truly educational outcomes of evaluation are ignored.

This study brings into focus the practice of assessing students in a ODL setting as opposed to a conventional mode yet realising that though one may claim to have adopted an ODL mode of delivering learning experiences, it is high time everyone must realise that the way all ODL institutions assess students is still conventional and has not much evolved. Thus it is recommended that;

1. The evaluation and analysis of both formative and summative assessments should be employed as an important systematic monitory process for Quality Assurance of assessments in the ODL setting.
2. The results from the evaluation and analysis of the assessment items is an informative data and should be used for course review purposes in terms of developing more effective pedagogical approaches and resource materials, towards achieving educational outcomes.

## Conclusion

Mehta and Saxena (2003) again provide a fitting beginning for the closing of this paper:

“Conventional testing lacks in measuring skill development and becomes futile in ascertaining changes in student behaviour, thus we have to believe that we are only limiting ourselves to norm – referenced testing, where not only students are compared within themselves but institutions are also compared between themselves. There do exist a few premier institutions, which are called “premier” because probably they have been able to achieve intended outcomes”.

Thus it is assumed that the analysis and evaluation of the old exam papers should be a continued and prominent feature for quality assurance of assessing students’ learning experiences and achievements whilst and after using the Open and Distance Learning materials. And this information should provide additional resourceful information for reviews of the ODL materials and be the driver for critical and constructive design of ODL materials by Instructional Designers.

Zawicki – Richter, *et.al* (2008) noted that research on distance education has been subject to harsh and consistent critique, for instance ‘there is a massive volume of amateur, unsystematic, and badly designed research producing information of very little value’ or ‘it is atheoretical and predominantly descriptive’. Though this may seem discouraging to a novice, other authors emphasise that “understanding trends and issues in terms of topics and methods is pivotal in the advancements of research on distance education (Lee, Driscoll, and Nelson, 2004)” and that the structure of a research discipline forms the foundation for identifying gaps and priority areas (Mishra.1998).

Having concluded thus, it should also be mentioned that on account of the nature of the study, especially the statistics, which has not been taken beyond the stage of simple average, the conclusions derived from this study cannot be considered conclusive or statistically significant. The author accept the criticism on the grounds that the method followed, and the statistics presented here are not sophisticated, but the limited objective of establishing a certain probability has been achieved fairly convincingly.

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