

Maintenance of quality learning

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Abstract

This paper addresses the observations made in the Garnaut/Namaliu Report which reported that students who enter state universities in PNG generally do not have the required level of skills and knowledge that are needed for university level studies. Studies have found that assessment of students' learning is a general weakness in PNG education institutions. This can contribute to students' knowledge gaps at all levels of education. Administration of regular assessments to monitor students' learning progress and achievement at the desired levels is a vital component of teaching and learning. Assessment data can inform the development of appropriate remedial programs to assist students to master skills and knowledge at the appropriate levels and also prepare students to achieve at comparable international education standards. This paper bases its discussion on a number of the research done in PNG and various literature consulted on quality teaching and learning.

Key words: regular assessment, learning progress, knowledge gaps, remedial programs, quality teaching and learning

Introduction

The delivery of quality education at all levels in PNG has been scrutinized by the educated stakeholders. It has been claimed that educators at university level commit considerable time in teaching skills and knowledge that students should have mastered at the lower levels of education before university entrance. It has also been claimed that students who graduate from the lower levels of education do not master skills at the prescribed levels in preparation for the next education level entrance. Consequently, the progress of advanced teaching and learning is delayed by remedial teaching to bridge the knowledge gaps that students come with to the next levels of education.

Possible reasons for knowledge gaps

Knowledge gaps in students' learning can be the consequence of a variety of factors. Guy, Paraide and Kippel (2001) and Paraide, Kippel, Kukari, Agigo and Irima (2010) did studies in four selected provinces- Madang, East New Britain, Eastern Highlands and Gulf provinces. Selected primary and secondary schools that the provincial education administration identified as those that had concerns with students' absenteeism and school withdrawal participated in these studies. Data was collected using teacher and student surveys and focus group discussions with parents, teachers and BOM members. The student survey was administered to grades 6, 7, 8, 9 and 10 students. The purposes of

these studies were to establish the reasons for students' school absenteeism and school withdrawal. Both studies found among others the following as contributing factors to students' school absenteeism and school withdrawal:

- teachers' school absenteeism;
- students' frequent school absenteeism due to illness;
- family problems, child labour and peer pressure;
- minimal or absence of teaching and learning resources;
- boring and unchallenging lessons;
- lessons viewed to be not worthwhile;
- subject content not understood well;
- subject content not taught well;
- subject content not covered as prescribed;
- poor students and parental attitude towards formal education; and
- lack of or inadequate feedback on students' learning.

The studies also found that students' and teachers' school absenteeism, prescribed subject content not taught, and subjects' content not taught well contributed greatly to knowledge gaps in subjects' contents and caused learning difficulties. In some case, where students were unable to catch up with subjects' content and were experiencing learning difficulties, made the decision to withdraw from school. Others were absent from school regularly because of their struggles with school subjects.

Kukari, Paraide and Kippel (2009) study also found similar results when they reviewed the education system in the Nimamar Rural Local Level Government on Lihir Island in the New Ireland Province. The study focused on seven key domains of education – student access to, and participation in education and training, school governance, school management, teacher quality, monitoring of education standards, students' attitudes towards education, parental attitudes towards education, development and implementation of a relevant curriculum, teaching and learning resources, school infrastructure and financing of education. This study covered all the education sectors – Basic education (elementary prep-grade 8), Secondary education, Technical and Vocational Education and Training (TVET), and Flexible, Open and Distance Education (FODE). Data was collected using teacher, student and parent surveys and focused group interviews with parents, Boards of Management and teachers.

This study found among others that the following factors contributed to students' poor performance in the 2007 Certificate of Basic Education examination:

- poor school governance;
- poor school management;
- poor quality of teachers;
- lack of supportive environment for students' learning;
- lack of effective monitoring of education standards;
- poor student attitude towards education;
- generally, poor parental attitude towards education;

- ineffective curriculum development, implementation and monitoring; and
- poor school infrastructure

These factors also contributed to poor students' performance in the 2007 Grade 10 High School Certificate Examination in the only secondary school on the island.

Honan, Evans, Muspratt, Paraide, Kippel and Tawaiyole (2006) during their review of the implementation of the elementary reform curriculum in eight provinces and Paraide, (1999, 2002 & 2009) during her review of the implementation of both elementary and lower primary curriculum in five provinces found that inadequate professional development and support for practising teachers, inappropriate teaching strategy used for in-service training, lack of in-depth coverage of content knowledge during teachers' in-services/workshops, and minimal or lack of awareness on effective teaching strategies as additional contributing factors to weak support for students' learning. Paraide, Evans, Honan, Muspratt and Reta. (2013) in their study with primary schools in two remote districts in two provinces also found that the progress of students' learning was not adequately monitored. The two districts' overall academic performances in the 2009 Certificate of Basic Education Examination were the lowest amongst the districts in both provinces. As emphasized in the assessment and reporting policy (Department of Education, 2003), the syllabuses (Department of Education, 2003, & 2004) series, and the learning module series (2007), assessment and monitoring of students' progress in learning is a key component of teaching and learning. This is because students' assessment results can provide feedback that can be used to inform the development of appropriate remedial programs to support students to master skills at the prescribed levels. Various forms of assessment tasks that can be used to monitor students' progress in learning are prescribed in the school curriculums (Department of Education, 2003, 2004 and 2007).

Way forward

Curriculums are central to formal teaching and learning. They guide teachers on what contents should be covered in each learning area, the teaching time that should be allocated to each learning area and prescribe various methods of assessing students' learning progress in them. Grima (2008 & 2011) discussed the vital role of curriculum in the delivery of quality education. She emphasised that a curriculum must have relevant aims that describe:

- what learners should learn and why
- the development of cognitive
- creative and social skills and values
- respect for human rights, the environment and peace
- have tolerance of cultural diversity.

These place citizenship, democracy and human rights in the fore front of students' education.

Grima (2008 & 2011) also stated that there must be subject balance in school/course curriculum which includes:

- how subjects are defined
- how many subject are taught in the school program or units in a course
- time allocated for each subject/unit/course.

Grima added that, it is vital to make good use of time. It is broadly agreed that the benchmark for hours committed to effective teaching each year is between 850 and 1,000 hours. Effective links between skills taught at all levels of education and the employment sector is vital. Subject taught at each level of education should be allocated sufficient time to allow for appropriate mastery at each level which should produce the foundation for the next level of learning. There must be positive correlations made between instruction time and students' levels of achievement/mastery at primary, secondary and tertiary levels (Grima, 2008 & 2011).

Grima (2008 & 2011) further discussed the critique and improvement of pedagogic approaches for better learning. She presented a number of critical areas which must be present in teaching primary, secondary and tertiary courses. These include:

- student-centred active pedagogy
- cooperative learning
- development of critical thinking
- problem-solving skills.

In addition, Grima (2008 & 2011) stressed that there must be a language policy which has to strike a balance between enabling people to use local languages in learning and ensuring that they have access to global languages. The language (s) of instruction is a policy choice that can impact on how well:

- a national curriculum is implemented
- the contents of subjects taught
- teaching pedagogy used.

What must be stressed to teachers in PNG learning institutions is that students and teachers must learn from various assessment results. Regular, reliable, and timely assessment is a key to improving learning and achieving desired outcomes. Regular formative assessment in all school subjects is needed as measures of progress towards the prescribed desired outcomes in the lessons/topics/units/courses taught. This can also contribute to preparation towards formal examinations if assessment instruments are well designed.

The goals of assessments are to:

- provide learners with feedback on the progress in their learning process
- improve learning in learners' areas of weaknesses
- provide teachers with feedback on their teaching effectiveness.

(Pohl, 2000) discussed the links of assessment tasks within curriculums to the Bloom taxonomy. Bloom taxonomy discusses the type of questions asked during teaching to assess the progress of students' learning and mastery of skills. It discusses six levels of questioning which focuses on knowledge, comprehension, analysis, application, synthesis and evaluation of subject content taught.

Applying Bloom's Taxonomy in assessment tasks

(Pohl, 2000) found that teachers frequently spend much of classroom time testing students through questions. General observations show that most teachers at all levels of education spend more than 90% of their teaching time testing students through questioning. Most of the questions that teachers ask are generally recall questions which seek basic factual or information based on text read that are based on short-term memory. Such questions do not encourage students to think beyond and above the information they are presented with as classified in the Bloom taxonomy.

Pohl (2000) clarified the taxonomy as a logical classification of cognitive levels of development organized in a systematic relationship from simple to complex thinking or activity which can be used to foster intended learning outcomes. He emphasized that the type of questions asked during teaching can determine the cognitive development level for students. For example, if teachers asked only recalled questions during lessons then the students may not develop higher order of thinking such as creative thinking or actually create something new using available information.

Pohl (2000) acknowledges that questioning is widely used during lessons and questioning is used to serve many functions. However, he cautioned that teachers tend to overuse factual questions. For example, factual questions such as 'What is the longest river in Papua New Guinea?' is generally asked to test learning outcomes. Pohl (2001) found that many teachers ask about 400 recall questions each on every school day. Approximately 80% of all the questions that teachers generally ask are recalled questions which only demand factual, literal, or knowledge-based answers. In such cases creative thinking does not take place because students are not challenged to think beyond the information they are presented with.

Quality teaching strategies are also guided by the Bloom Taxonomy or classification order of learning. Bloom's Taxonomy is a multi-level model of classifying six cognitive levels of learning difficulties. This model guides teachers to encourage their students to progress to a higher level of learning. The lowest three levels of the classification are: knowledge, comprehension, and application and the highest three levels are: analysis, synthesis, and evaluation. The taxonomy is ordered in stages starting from the lowest cognitive level of learning to the highest cognitive level of learning (Pohl, 2000). This means that students have to learn the basic knowledge first before they are able to understand the concepts or knowledge learned, apply it in other situations, analyze the information they have learned and compare it with other

similar knowledge, evaluate the information, amend it or improve it and use all available information to create new knowledge or invent new appliances, devices or tools. Diagram 1 shows the levels of learning described in the Bloom taxonomy. The Bloom taxonomy was revised by Lorin Anderson, one of Bloom's students. The words of the domains have been changed and the two highest levels have been swapped. This order is more natural than the original Bloom hierarchy of cognitive order of learning (Pohl, 2000). The changes are reflected in the diagram presented.

Diagram 1: Revised Bloom' Taxonomy

Original Domain\	New Domain
Evaluation	Creating (ability to create new knowledge/tools using available information)
Synthesis	Evaluating (ability to evaluate new information and test if it works)
Analysis	Analyzing (ability to critique knowledge used and improve further)
Application	Applying (ability to apply knowledge learned in other situations)
Comprehension	Understanding (ability to understand basic knowledge learned)
Knowledge	Remembering (basic knowledge learned/already have)

Source: Revised Bloom Taxonomy Diagram (Pohl, 2000). Additional notes are provided by this author.

Use of assessment in the learning process

Classroom assessment is among teachers' most essential educational tools. When assessment instruments are properly developed and the results are analysed well, the information can be used to assist the teachers to better understand the students' learning needs (Department of Education, 2003).

The various assessment tasks administered in the various school subjects can be used by teachers as a means to collect evidence about the students' learning gaps, what they know and can do independently, what their strengths are and areas of interest. The Educational Testing Service document (2003:1) also stresses that classroom assessments can assist teachers to:

- identify students' strengths and weaknesses
- monitor students' learning and progress
- plan and conduct appropriate instruction for students.

The document also emphasises that ongoing informal and formal classroom assessments:

- links teaching and learning together
- allows teachers to monitor their teaching effectiveness as well as students' learning
- can motivate and shape teaching strategies and students' learning
- can assist teachers to determine students' mastering of required skills
- can assist teachers to judge whether students are prepared for examinations that are used for selections for higher levels of learning
- can assist students to improve their own academic performance.

The Educational Testing Service document (2003) emphasizes that classroom assessments do not measure only the students' learning. It also focuses on what content is to be assessed, how students should be assessed in them, and how the assessment results are communicated to the parents and students. This sends a clear message to them about what subjects are worth learning, how they should be learned and how well the parents and teachers expect them to perform in them. Therefore, designing formative assessments requires strategic planning and a clear understanding of what needs to be assessed and why. When planning teaching activities, teachers need to:

- keep learning goals in mind
- consider assessment strategies
- determine what factors would provide evidence that the students have reached the desired learning goals.

Ainsworth and Viegut (2006) in their discussions on formative and summative assessment highlighted that formative assessments supports teachers and students in decision making during educational and learning processes while summative assessments occurs at the end of the unit/topic. The PNG curriculum documents (Department of Education, 2003, 2004 and 2007), discuss various assessments tasks that can be used by teachers to assess the level of students' achievement during teaching of units and topics. Marzano (2006) when discussing assessments also stated that formative assessment has a strong research base supporting its impact on learning.

The PNG Government's Vision 2050 Plan advocates for the creation of a productive human resource between now and 2050 as top priority (Government of PNG, 2009:24). In response to the human resource development priority, the PNG National Department of Education is now focused on the delivery of a quality basic and secondary education (Department of Education, 2005). This can be sound foundation for tertiary education if the Bloom hierarchy of cognitive order of learning is captured during teaching strategies and assessment tasks at these levels of education. The UNESCO 2004 report and EFA 2005 report emphasize that to ensure that quality teaching and learning are achieved in formal learning environments, continuous professional development for teachers in elementary, primary, secondary and tertiary education is one of the key components to the delivery of quality education. Teachers must have the skills on how to use assessment data to reflect on their

teaching strategies and monitor students' learning in order to support their learning developments appropriately. A most critical area in teaching is the assessment strategies used during teaching to evaluate students' learning. As Ganly emphasized:

There are many strategies that are used in performance assessment, and the performance of a student can be assessed during many classroom activities. Group work, oral presentations, tests, artwork, and student made projects are all tools that can be used to assess the performance of students (Ganly, 2008:1)

Lemlech (2006) added to the discussion by drawing attention to the fact that many processes and procedures can be used to assess the students' process in learning. Various assessment tasks should be used to gather data which can be used to evaluate students' performances and determine their grading in class. Lemlech also stresses that assessment is a very common and effective method of evaluating the progress of students' learning.

Paraide, Evans, Honan, Muspratt and Reta (2013) found while working with primary school teachers in remote schools that the teachers' participation in action research to solve teaching and learning issues enabled them to observe firsthand the use of assessment data to inform their teaching strategies and assess the progress of their students' learning. This heightened their willingness to reflect on teaching strategies used and make amendments where necessary and appropriate, and also begin to use assessment data to monitor their students' learning progress.

Conclusion

The Garnaut/Namaliu Report suggests that the drop in quality education at university level in PNG is the result of providing a university education for a larger population, the existing facilities cannot adequately cater for quality support for teaching and learning, the current deteriorating state of various infrastructures, and students who graduate from secondary schools have not acquired the required levels of skills and content knowledge needed to enroll in university courses. This paper discusses some of the causes of students' knowledge gaps in primary and secondary schools as possible contributing factors to such a lack. Students' and teachers' absenteeism, prescribed subjects' content not taught, subject content not taught well and the absence or minimal monitoring and assessment of students' learning progress are some of the contributing factors to these learning gaps.

The current school curriculums which include the assessment policy are guided by the Bloom taxonomy. This is already in place to guide teachers to teach subject content and skills to the required levels and construct appropriate assessment tasks to measure students' progressive learning. The assessment policy emphasizes the value for regular monitoring and evaluation of students' learning progress in all grades. It also encourages the design of various assessment tasks that can accurately capture mastery of skills or learning

outcomes at the prescribed progressing levels. The available curriculum documents prescribe that assessment data should be primarily used by teachers to reflect on teaching effectiveness and to monitor students' learning progress.

The PNG curriculums encourage teachers to use both formative and summative assessment tasks during teaching. If the Bloom taxonomy is used as a guide when preparing lessons and constructing assessment tasks, assessment results are used for diagnostic purposes, and assessment results are used to inform development of remedial programs, then the students' learning and mastery of skills at the prescribed levels can be achieved. Most importantly, regular monitoring and evaluation of students' learning can enhance better foundation preparations in terms of mastery of skills at the appropriate levels in readiness for learning at the next levels, including tertiary education and the work force.

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