

Perception and Awareness of Nigerian Students towards Outcome-Based Education

Jessica Cabaces, Alexis Jan S. Blanco, John Erick A. Cabañas, Chester G. Casapao, Jettro P. De Guzman, Michael Angelo C. De Villa, Roy Vincent R. Derla

To Link this Article: http://dx.doi.org/10.6007/IJARPED/v3-i1/761 DOI: 10.6007/IJARPED/v3-i1/761

Received: 19 January 2014, Revised: 22 February 2014, Accepted: 12 March 2014

Published Online: 28 March 2014

In-Text Citation: (Cabaces et al., 2014)

To Cite this Article: Cabaces, J., Blanco, A. J. S., Cabañas, J. E. A., Casapao, C. G., Guzman, J. P. De, Villa, M. A. C. De, & Derla, R. V. R. (2014). Perception and Awareness of Nigerian Students towards Outcome-Based Education. *International Journal of Academic Research in Progressive Education and Development*, *3*(1), 222–233.

Copyright: © 2014 The Author(s)

Published by Human Resource Management Academic Research Society (www.hrmars.com)

This article is published under the Creative Commons Attribution (CC BY 4.0) license. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this license may be seen at: http://creativecommons.org/licences/by/4.0/legalcode

Vol. 3(1) 2014, Pg. 222 - 233

http://hrmars.com/index.php/pages/detail/IJARPED

JOURNAL HOMEPAGE

Full Terms & Conditions of access and use can be found at http://hrmars.com/index.php/pages/detail/publication-ethics





ISSN: 2226-6348

Perception and Awareness of Nigerian Students towards Outcome-Based Education

Ms. Jessica Cabaces, Alexis Jan S. Blanco, John Erick A. Cabañas, Chester G. Casapao, Jettro P. De Guzman, Michael Angelo C. De Villa, Roy Vincent R. Derla

Lyceum International Maritime Academy, Lyceum of the Philippines University, Batangas City, **Philippines**

Abstract

This research work was pursued to identify the perception of Nigerian students towards OBE enrolled in Bachelor of Science in Marine Transportation (BSMT) and Bachelor of Science in Marine Engineering (BSMarE), to determine the level of awareness of Nigerian students towards OBE and to propose action plan that can increase the level of awareness of every Nigerian student. The researchers used descriptive method of research and questionnaire as the primary data gathering tool. The respondents of the study were fifty (50) Nigerian students of Lyceum International Maritime Academy on the basis of random sampling. Results showed that the respondents have clear perception on OBE and aware to the implementation of OBE. The researchers recommended that Nigerian students may be required to take an assessment examination to measure their learning skills and how effective OBE is to them, Maritime schools like Lyceum International Maritime Academy may provide an OBE program for all their students so as to enhance their skills in studying their courses, Nigerian students who are unaware of the implementation of Outcome-Based Education (OBE) program may be provided seminar about OBE to increase their knowledge and skills in coping up with their courses, the university administrator may conduct trainings and orientations with the professors and students to increase the level of awareness regarding OBE, and faculty members may study more about the courses they are teaching so as to be more professional on their respective fields of studies as new methods of teachings are being applied.

Keywords: Outcomes-Based Education, Nigerian Students, Maritime Education

Introduction

In the international arena, education is the determinant of competence of a professional. Education, particularly higher education, is the ultimate tool that will provide an individual a key to acquire knowledge and skills conducive in the preparation for the professional job in certain discipline. Yet the traditional system of education generates individual who does not match to the globally advanced environment of professionals. This phenomenon paves the way

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

to the creation of reforms in the system of education.

Outcome-based education (OBE) is currently favored internationally to promote educational renewal (Malan, 2000). It is defined as an effort of education that converges the traditional focus on what the school provides to students, in favor of making students demonstrate that they "know and are able to do" whatever the required outcomes are. It requires the students to demonstrate what they have learned the required skills and content. Outcome-based education (OBE) is a recurring education reform model. Higher education is pressured to come up with quality assurance or quality enhancement of teaching and learning. This means that students demand high profile programmes that will enhance their prospects. Hence, the challenge lies on how the higher institution will provide the relevant approach to teaching that will address those aspects that bear upon teaching and learning (Guico & Dolor, 2013).

On the other hand, outcome-based education is only optional to all educational institutions which create new impact to the students' perspective. In the Philippines, Lyceum of the Philippines University-Batangas (LPU-B) adopted outcome-based education for the entire program it offers including maritime studies. Faculty members were given orientations to equip them with the necessary knowledge and skills in preparation for OBE implementation and International accreditations that require the same approach to education (Laguador & Dotong, 2014). There were about 306 Nigerian students who are newly- enrolled in Marine Transportation and Marine Engineering programs in Lyceum International Maritime Academy during the first year of implementation of OBE. As such, the general purpose of this study is to assess the level of awareness of Nigerian Students in LIMA towards OBE. In determining the level of awareness of the students, the institution would effectively implement OBE and find ways to help students to solve their problems in adapting this educational reform. Additionally, this study would lead to development of the framework of OBE design that would greatly help this institution to generate globally competitive professionals.

Objectives of the Study

Given the general purpose above, this study intends to find out the perception and level of awareness of the Nigerian students towards outcome-based education. Specifically, the study aimed 1) to identify the perception of every Nigerian student towards OBE, 2) to determine the level of awareness of Nigerian students towards OBE and 3) to propose action plan that can increase the level of awareness of every Nigerian student.

Literature Review

In the new era of education, reforms had made to establish a method of teaching far from the traditional ones. To meet the standards of internationalization is the primary purpose of institutions in adopting this method. The rebirth of educational structure results to the formation of Outcome-Based Education (OBE).

Spady (1994, as cited in Malan, 2000) defined OBE as a "...comprehensive approach to organizing and operating an education system that is focused in and defined by the

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

successful demonstrations of learning sought from each student"

Moreover, (Tucker, 2004) also defined outcomes based education (OBE) as a process that involves the restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of high order learning and mastery rather than the accumulation of course credits".

OBE is a learner-centred, result-oriented approach premised on the belief that all learners can learn and succeed. Outcome-based education means focusing and organising a school's entire program and instructional efforts around the clearly defined outcomes that all learners needs to demonstrate when they leave the school (Spady, 1994, as cited in Velupillai, 2007).

According to Spady (1994, as cited in Malan, 2000) the basic principle of transformational OBE is the clarity of the focus. This principle infers that curriculum development, implementation and evaluation should be geared by the outcomes which are expected as the culminating demonstrations of the learners. Once these outcomes have been identified, the curriculum is constructed by backward mapping of knowledge and skills. The design down aspect infers that all curricular and educational activities should be designed back from the point where the "exit outcomes" are expected to happen.

Furthermore, Davis (2003) stated that the educational outcomes are clearly specified and decisions about the content and how it is organised, the educational strategies, the teaching methods, the assessment procedures and the educational environment are made in the context of the stated learning outcomes. Thus outcome- based education has two requirements. First that the learning outcomes are identified, made explicit and communicated to all concerned, including the students, the teachers, the public, employers and other stake-holders. (The range of stake-holders may all be involved also in determination of the learning outcomes.) Second, the educational outcomes should be the over-riding issue in decisions about the curriculum. Staff should consider course content, teaching methods, educational strategies and time allocated, in terms of the learning outcomes achieved by the course. It should be made explicit, for example, through study guides, how the course contributes to the learning outcomes.

An outcome is a culminating demonstration of learning; it is what the student should be able to do at the end of a course. Outcome-based education is an approach to education in which decisions about the curriculum are driven by the exit learning outcomes that the students should display at the end of the course. "In outcome-based education," suggest Harden and colleagues, "product defines process. Outcome-based education can be summed up as results-oriented thinking and is the opposite of input- based education where the emphasis is on the educational process and where we are happy to accept whatever is the result" (emphasis original). There is a significant difference between outcome-based education and simply producing outcomes for an existing curriculum. "Outcome-based," insists Spady, "does not mean curriculum based with outcomes sprinkled on top. It is a transformational way of doing business in education" (Davis, 2003)

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

The principle of high expectations elicits higher level of standards then would normally be set as only those can be labeled completed. Further learners are supported to culminate higher level of performance (Malan, 2000). Expanded opportunities provide for a flexible approach in time and teaching methodologies matched against the needs of the learner allowing more than one opportunity to succeed (Killen, 2000).

Several studies (Spady, 1994; Gultig et al., 1998, as cited in Jordaan, 2000) stress that purposes of OBE are the two-fold philosophies which are to ensure all learners to be successful by means of equipping knowledge, skills and qualities (values and attitudes) required after they exit the educational system and to achieve and maximize selected outcomes for all students by structuring and operating education facilities to be success oriented.

Spady also advises that while all learners can learn and succeed, they cannot do so on the same day because learners have different learning rates as well as learning styles. Further since successful learning breeds more successful learning the importance of having a stronger cognitive and psychological foundation of prior learning cannot be underestimated. And since the conditions directly affecting learning are under the "educational system's control", learning is dependent on the willingness of teachers and others to believe in the approach and support learners in their learning (Malan, 2000).

OBE promises high level of learning for all students as it facilitates the achievement of the outcomes, characterised by its appropriateness to each learner's development level and active and experienced-based learning. Moreover, knowing that this system is going to be used would also give students the freedom to study the content of the course in a way that helps them learn it. In addition, Acharya (2011) concluded that OBE involves administrators, educators, parents, teachers and students for successful implementation. She further emphasized OBE as a method of curriculum design and teaching that focuses on what students can actually do after they are taught. She also mentioned that there is a rapid spread of various forms of outcome-based education in countries such as USA, UK and Australia during 1980 and 1990s.

According to Caguimbal et al (2013), Lyceum of the Philippines University- Manila and Cavite academic officials composed of the deans, college secretaries, chairpersons underwent a one-day seminar workshop on "Outcome-based Education" or OBE facilitated by Dr. Conrado E. Iñigo, Jr., Vice President for Academic Affairs (VPAA) held at the Freedom Hall last April 7, 2010. Dr. Iñigo, Jr. discussed the role of OBE in LPU's quest to be the leading university in the Asia Pacific region. He stressed the importance of identifying the outcomes or the result that the students have to acquire after each lesson. He also mentioned the need of the curricula to be evaluated after each academic year and be validated after each cycle (four years) to ensure that the target outcomes are met. With the shift to OBE, the VPAA requested all the academic units to start reviewing and revising the syllabi and curricula for all implementation by AY 2011-2012.

The banner news of tabloid issue A.Y. 2011-2012 revealed how students reacted to the

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

implementation of Outcome-Based Education (OBE), the newest educational scheme adopted by the university. During the dialogue with the PHOENIX, University President Peter P. Laurel said that complaints and reactions from the students are expected because OBE was piloted this year and we can use these comments for the improvement of the implementation of OBE. Laurel added that OBE is a new trend in education. Therefore, all good institutions abroad are doing it. He mentioned that there is no excellent school without OBE. With OBE, administrations and faculty members can work closely with students. Soon, all institutions in the country will be implementing OBE (Caguimbal et al., 2013).

This method of teaching, as quite observed, is being applied in the country a long time ago without solid framework and referential model. The foreign students whose educational foundation is the old educational system need imperative solution for effective implementation of OBE. Foreign student population of LPU-B is being dominated by Nigerians with a population of 306.

Based on the report of Saint, Hartnett, and Strassner (2003), much of university teaching in Nigeria is based on traditional pedagogy and conventional curricula, and does not even meet the government's own standards in these areas. Furthermore, the content and method of Nigerian university teaching is often outdated, not responsive to employers' requirements, and disconnected from the labor market in today's world.

Likewise, its research output is extremely low and unable to prompt innovation-based productivity gains. In Nigeria, long periods of military rule have created problems of instability, uncertainty and degeneration on the political, economic, social and educational scenes. There are very many educational policies which are released in the form of decrees and edicts, but the policy implementation has been haphazard and quite unsatisfactory. Irregular and sudden changes in the government leadership result in good educational policies failing to be implemented in full or even started. Many people have attributed the various crises currently plaguing the Nigerian education system to the poor and unstable national leadership, the ripple effects of which tend to hit education programmes and institutions hardest. To make matters worse for the Nigerians and the education system, military regimes have no defined mandate and duration, so the military officers appointed by their seniors to administrative and political positions see their appointments as temporary. They have no constituency and, invariably, they are posted to administer a state other than that of their own origin. With little commitment to the people or to the development of the education system, they cannot afford the luxury of long-term planning (Nwagwu, 1997).

Nigerian educational system has gone through reforms and significant changes. These reforms marked different epochs in the nation's educational history. Assessment of whole or part of the educational system is a necessary condition. Evaluation of teaching and learning in the Nigerian educational system consisted essentially of tests and examinations often conducted by teachers or instructors, examining bodies or government departments The higher institutions consisting of universities, polytechnics and colleges of education adopted the course system,

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

most of them conducted examinations usually at term, semester, or session ends as the case may be. Occasional tests, assignments, essays or term papers were undertaken by tertiary level students in the course of their programmes as part of the examination process. All these practices or procedures were carried out along with external moderation by way of appointment and use of moderators from similar institutions with the view to maintaining standards. This applied only to final-year and postgraduate programmes.

On the other hand, these reforms do not suffice to the wide range crises of education. "At present, our education environment and the outlook for education in Nigeria are bedevilled with many problems, some of which appear intractable and are like recurring decimals" (Obasanjo, 2012, "Lecture", para. 16).

Materials and Methods

Research Design

The study used descriptive method of research. It is used to describe characteristics of a population or phenomenon being studied. It includes the process of gathering, analyzing, classifying and tabulating data. Descriptive research is usually used in writing various types of researches as it covers the widest area among any other methods of investigation.

Participants

The respondents of the study were fifty (50) Nigerian students of Lyceum International Maritime Academy. They are the BSMT JII-A-N, BSMT JII-B-N, BSMT JII- C-N, BSMarE JII-A-N and BSMarE JII-B-N. Each section has ten (10) respondents. The respondents were chosen through random sampling.

Instrument

In order to gather data, researchers used questionnaire which is constructed and modified based from the previous researches related to the study and individual questions formed by the researchers. The researchers consulted their adviser in the preparation of the questionnaire, which has two parts. The first part consists of questions about the respondent's perception about the Outcome-based Education program. The second part consists of questions about the awareness of respondents in relation to Outcome-based Education program. The researchers also utilized the materials available in the library such as books, research studies, magazine and internet.

Procedures

The researchers selected the topic "An Assessment on Perception And Awareness Of Nigerian Students Towards Outcome-Based Education" in order to assess the respondents' level of awareness on Outcome-Based Education. The questionnaires were made with the approval of Prof. Jessica H. Cabaces, Researchers' Adviser. Then, the researchers distributed the questionnaires to fifty (50) Nigerian students of Lyceum International Maritime Academy who are randomly selected with the content of the questionnaires explained to them clearly. Retrieval of the accomplished questionnaires was done immediately after the distribution.

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

Statistical Treatment

Ranking was used to derive the highest and lowest points of weighted mean from the set perceptions and determinants of OBE. Weighted Mean was applied to consolidate the answers of respondents to each question. It was used to identify the perception of Nigerian Students towards OBE and determine the level of awareness of Nigerian students on OBE. Composite Mean was used to get the average mean to come up with the general result of students' response for each part of the questionnaire. Likert Scale was used with corresponding values from 1 to 4 scales, one being the lowest and four being the highest. The computed mean ratings were evaluated according to the following interval scale as follows:

Scale	Verbal Interpretation	
3.50 - 4.00	Strongly Agree (SA)	Strongly Aware (SA)
2.50 - 3.49	Agree (A)	Aware (A)
1.50 - 2.49	Moderately Agree (MA)	Moderately Aware (MA)
1.00 - 1.49	Disagree (D)	Not Aware (NA)

Results and Discussions

This part presents the data gathered from the answers of the respondents. The data gathered were tabulated and presented with the analysis and interpretation for better understanding.

Table 1 presents the mean score of the perception of the Nigerian students on Outcomes Based Education. It can be observed from the table that the students have clear perception on OBE having a composite mean of 2.71. All the items yield low to high mean ranging from 2.04 - 3.08 interpreted as "Agree" and "Moderately Agree".

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

Table 1. Mean Score of the Perception of Nigerian Students towards the Outcome-Based Education (OBE) Program

Perception on OBE			Rank
 OBE prepares the student better for the workplace. 	2.38	MA	8
2. OBE requires more responsibilities from Academics than content driven programmes.	2.68	Α	7
3. OBE approach for learning requires that every faculty be a specialist in his/her subject.	3.08	Α	1
4. OBE approach of learning the students pass rate would increase	2.24	MA	9
OBE approach to learning would be a waste of time.	2.04	MA	10
6. OBE requires more time to execute the lesson.	2.92	Α	4
7. OBE strengthens the capabilities and skills of the students	2.82	Α	6
8. In an OBE approach, teachers must act as facilitator and not a lecturer.	2.98	Α	3
9. OBE approach to learning would require more liaisons with industry. 10. Learners, educators and others who support learning have to	2.88	Α	5
become more attune to creating the conditions that supports learning and attainment of desired outcomes.	3.04	Α	2
Composite Mean			

As seen from the table, the respondents agreed that OBE approach for learning requires that every faculty be a specialist in his/her subject having a weighted mean of 3.08. Second in rank among the perceptions on OBE is learners, educators and others who support learning have to become more attune to creating the conditions that supports learning and attainment of desired outcomes (3.04). It is followed by in an OBE approach teachers must act as facilitator and not a lecturer (2.98). However among the perceptions on OBE, the last three (3) in rank and moderately agreed by the respondents are OBE prepares the student better for the workplace (2.38), learners, educators and others who support learning have to become more attune to creating the conditions that supports learning and attainment of desired outcomes (2.24) and OBE approach to learning would be a waste of time (2.04). This implicates that the respondents have assenting and clear perceptions on OBE.

As Acharya (2011) concluded that OBE involves administrators, educators, parents, teachers and students for successful implementation, the positive result on perception of Nigerian students generates an inference that OBE is well- implemented.

Table 2 shows the mean score of the awareness of Nigerian students towards OBE. It can be seen from the table that most of the respondents are aware on OBE having a composite mean of 2.63. All the items yield low to high mean ranging from 2.38 -278 interpreted as "Moderately Aware" and "Aware".

As seen from the table, OBE promotes the acquisition of the specific skills and competencies in a country in which there are many skills shortages (2.78) got the highest rank and interpreted as aware. Next in rank is OBE fosters a better integration between education at

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

school, workplace and higher education level (2.74). It is followed by Well-defined assessment criteria makes it clear to both assessors and learners how assessment will take place (2.72) and learners know exactly what is expected from them as unit standards make it very clear what is required from them (2.64).

Table 2. Mean Score on the Level of Awareness of Nigerian Students towards the Outcome-Based Education (OBE)

Determinants of OBE	WM	VI	Rank
1. Learners know exactly what is expected from them as unit standards make it very clear what is required from them.	2.64	Aware	4
2. There is greater buy-in and support for OBE from all role- players due to the extensive level of consultation and stakeholder involvement.	2.38	Moderately Aware	8
3. Well-defined assessment criteria makes it clear to both assessors and learners how assessment will take place.	2.72	Aware	3
4. Assessment is more objective and fair as a result of the predetermined assessment criteria.	2.54	Aware	7
5. OBE promotes the acquisition of the specific skills and competencies in a country in which there are many skills shortages.	2.78	Aware	1
6. OBE fosters a better integration between education at school, workplace and higher education level.	2.74	Aware	2
7. OBE helps learners to accept responsibility for learning, as they are now at the centre of the learning process.	2.62	Aware	5.5
8. Duplication and repetition of previous learning situations.	2.62	Aware	5.5
Composite Mean	2.63	Aware	

On the other hand, the last two in ranks aware and moderately aware respectively are assessment is more objective and fair as a result of the predetermined assessment criteria (2.54) and there is greater buy-in and support for OBE from all role-players due to the extensive level of consultation and stakeholder involvement (2.38). Since most of the Nigerian students had clear perception on OBE, they are aware with the program and determinants of Outcomes Based Education. Teachers must always monitor the grades of the students and inform them regarding the status of their class performance every after the major examination so that they would know how they perform in the course (Laguador & Pesigan, 2013). It is supported by the study of Caguimbal et.al (2011) which resulted that the Maritime students are aware of the advantages (determinants) of OBE. This entails that Nigerian Students are aware to the implementation of OBE in Lyceum of the Philippines University-Batangas.

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

Table 3. Plan of Action to be done to Increase the Level of Awareness of Nigerian Students

Program	Objectives	Implementation	Person	
			Responsible	
Cultural	To enhance the acceptance of			
Transformation	students and educators towards	Seminar Educational		
and Assimilation	the evolving system of education	Activities	LPU-B	
of Plans	and to integrate the plan into the	Activities	Management	
	existing norms			
	To improve the implementation of	Board	LPU-B	
Continuous	OBE and adopt new trend,	Meeting	Management	
Improvement	methods, thus empowering the	Conferenc	Professors and	
	execution of OBE and awareness of	е	Instructors	
	students.			
	To provide a set of standards for	Seminar Educational		
Benchmarkin	the integral model of OBE in order	Activities	LPU-B	
g	to establish a clear perception		Management	
	towards it.			

Conclusions and Recommendation

The respondents have clear perception on Outcomes-Based Education (OBE). Nigerian students are aware to the implementation of OBE. An action plan was proposed by the researchers to increase the level of awareness of Nigerian students.

The Nigerian students may be required to take an assessment examination to measure their learning skills and how effective OBE is to them. Maritime schools like Lyceum International Maritime Academy may provide an OBE program for all their students so as to enhance their skills in studying their courses. Nigerian students who are unaware of the implementation of Outcome-Based Education (OBE) program may be provided seminar about OBE to increase their knowledge and skills in coping up with their courses. The university administrator may conduct trainings and orientations with the professors and students to increase the level of awareness regarding OBE. Faculty members may study more about the courses they are teaching so as to be more professional on their respective fields of studies as new methods of teachings are being applied. The administration may take into consideration the action plan that was proposed by the researchers to increase the level of awareness on OBE.

References

- Acharya, C. (2011). Outcome—based Education (OBE): A New Paradigm for Learning Centre for Development of Teaching and Learning.
- Guico, T. M., & Dolor G. (2013). Level of Awareness and Possible Concerns of the Marine Faculty Members on Outcomes-Based Education, Journal of International Academic Research for Multidisciplinary, 1(7): 159 167
- Jordaan, C. J. (2007). Attitudes Towards Outcomes-Based Education And Training At Tshwane University of Technology. Tshwane University of Technology.

Vol. 3, No. 1, 2013, E-ISSN: 2226-6348 © 2013 HRMARS

- Killen, R. (2000). Outcomes-Based Education: Principles and Possibilities. Unpublished manuscript. University of Newcastle, Australia: Faculty of Education. Retrieved September 2013 from http://www.schools.nt.edu.au/curricbr/cf/outcomefocus/Killen paper.pdf
- Laguador, J. M., Dotong, C. I. (2014). Knowledge versus Practice on the Outcomes-Based Education Implementation of the Engineering Faculty Members in LPU, International Journal of Academic Research in Progressive Education and Development, 3(1):63-74, URL: http://dx.doi.org/10.6007/IJARPED/v3-i1/640
- Laguador, J. M., Pesigan, M. (2013). Academic Performance and Measure of Character and Personality of Engineering Students With And Without Referral From Counselling Center, Asian Academic Research Journal of Social Sciences & Humanities, 1(16): 281-293.
- Malan, B. (2000). The New Paradigm of Outcomes-based Education in Perspective. Tydskrif vir Verbruikerwetenskappe, 28, 22-28. Retrieved August 2013 from http://www.up.ac.za/academic/acadorgs/saafecs/vol28/malan.html
- Nwagwu, C. (1997). The Environment of Crises in the Nigerian Education System Comparative Education. Volume 33 No. 1 pp. 87±95.
- Tucker, B. (2004). Literature Review: Outcomes-focused Education in Universities. Learning Support Network, Curtin University of Technology. Retrieved September 2013 from http://lsn.curtin.edu.au/outcomes/docs/LitReview.pdf
- Velupillai, V. (2007). An Investigation into how Mathematics Educators Teach Outcomes-Based Curriculum. University of Pretoria.