International Journal of Learning, Teaching, and Educational Research
Vol. 15, No. 8, pp. 35-48, July 2016

The Conundrum of Handling Multiple Grouped Statistics Class at a Tertiary Education and the Impact on Student Performance

Victor Katoma, Innocent Maposa and Errol Tyobeka
Namibia University of Science and Technology

Abstract. A learning organization is capable of renewing itself. It consistently reflects and vigorously seeks improvement. This research focused on course management of a basic statistics course at a university in Namibia in which multiple groups were taught by different lecturers, a setting also known as parallel teaching. The total number of students was 460 split into five groups. Using multiple comparison tests, results revealed significant variances in assessment marks within and between four out of the five groups. This can be attributed to a lack of concrete coordination among lecturers and a possible deficiency in academic peer interaction between students in the separate groups. However, when marks were aggregated according to mode of study, results showed that part-time students were more likely to pass compared to their full-time counterparts who took the same course ($t = 2.7391$). This was in spite of full-time students having more peer interaction and probably less family responsibilities. This finding could be an indication that full-time students needed different levels of motivation or study strategy that resonated with the predominant class management styles. It is suggested that research should pay more attention to the qualitative aspects of the problems facing multiple grouped classes, especially in statistics in order to optimally leverage learning outcomes.

Keywords: multiple groups; learning; comparison; students

Introduction

A seemingly bad policy if well managed is better than an inconsistent one when it comes to managing multiple grouped classes(parallel teaching), especially in a rapidly changing environment such as the under researched university. All students, but especially beginning ones, need sustained consistency in course delivery. It helps them to manage anxiety that university or college-level learning experiences bring.

While motivated lecturers are likely to consistently achieve course improvement individually, many course offerings with multiple student groups and several lecturers pose numerous discrepancies in course management. First, the level of coordination between lecturers of these groups largely determines the learning outcomes across the whole course. With diminished lecturer coordination, individual groups are likely to drift from the common points and intensity of focus which ultimately affects collective comprehension of course content by students. The drift stems largely from two (2) secondary-learning experiences: individual lecturer actors, and delivery methods (Herbert, Joyce, & Hassall, 2008). Such learning challenges have also been noted at course level in business schools (Nordberg, 2008) and are not unusual in virtual learning environments (Burridge & Oztel, 2008). Second, the challenges emerging at the course level can easily accrue to programme level when multiple lecturers attempt to deliver curriculum courses. Third, persistent course management inconsistencies within and across groups can lead students to sense a lack of preparation and of unstiffened course intensity. Subsequently, students would passively disengage from certain topics (Kerr, 2011), the course and worse still the entire programme. Strong indication of student indignation would manifest in high failure rates and sometimes surprise quits or change of study programmes.

In general, the challenges associated with parallel teaching are immense and can easily be compounded by lacklustre coordination efforts among teaching staff. However, in this regard, we are motivated primarily by the "activist approach" which affirms that organizational members often institute intentional change effort (Astin, 2001). We believe that at least the career propriety of the lecturing staff bring along basic class management skills and control mechanisms to build from. With this in mind this research set out to explore factors affecting teaching and class management in basic statistics (BBS11S) at a university in Namibia. The main reason for researching BBS11S was prompted by high failure rates and the context in which parallel teaching was conducted.

Quality in teaching multiple statistics classes

In statistics, like other mathematically intensive courses, a quality-focused lecturer is expected to continually improve course content delivery methods (Beidatsch, 2007). This include re-aligning course content with possible references to industrial application and providing opportunities for students to

assimilate and absorb content in appropriate time. This is however, hard to achieve, especially with large classes that are subdivided into smaller groups and managed by different lecturers. Lecturers usually bring to such classes different experiences and hence influence these groups in their own rights. Initial indication of group differences can be noted easily from student's sentiments and speculations about which group they would want to associate themselves with. These may be expressed in different ways, including suspicions that certain lecturers teach with an examination in mind.

One natural adage of a multiple group system, however, is that students benefit from individual lecturer expertise due to student-teacher proximity and easy peer learning because of reduced social distance. Smaller groups are also less resource intensive and if well managed are likely to easily fulfil intended learning outcomes. With smaller groups, Beidatsch (2007) further noted the ability in developing high order thinking through evaluation and reflection as the locus of learning easily shifts to interaction.

Quality in teaching large "solo" classes

Huge "solo" classes are common in Sub-Saharan Africa mostly because of the rapid growth in tertiary education enrolment without an equivalent expansion of institutional capacities (UNESCO, 2010; Yizengaw, 2008). Australian academics are increasingly faced with similar challenges of managing large classes (Bradley, Noonan & Scales, 2008). Particularly, large classes are a common practice for students in first- year in Science, Business and Arts discipline, as well as courses that are inter-discipline.
Managing such classes effectively require recourses such as high capacity lecture venues and teaching assistants or co-teachers. In the absence of these mechanisms, solo classes tend to affirm an overwhelming focus on lectures and terminal examinations (Rayner, 2012; Tessema, 2009) and less on teaching facilitation. Additionally, large classes pose obvious challenges such as high numbers of assessment scripts to mark, and other qualitative problems such as complexities in continuous assessment and examination management. Furthermore, the time involved in addressing large numbers of individual student challenges is significant and if left to course coordinators, can be overwhelming. However, departments can do much more by supporting their staff through the provision of administrative support in form of class management training, sufficient funding for tutors, recognition of the work involved in workload allocation, credit in performance appraisal and the like. Large classes, if well managed *do* have advantages over multiple small classes, especially through standardisation of the learning experiences (McLeod, 1998).

This paper does not exclusively aim to compare solo and small classes. It seeks to explore strategies that may be helpful in strengthening the teaching and learning in multiple grouped classes in statistics. For institutions with limited resources, the paper attempts to provide ground upon which other appropriate class management methods can be selected. While some existing literature, for

example indicate nonsignificant relationship between class size and the effect on learning outcomes (Hancook, 1996; Kennedy & Siegfried, 1997; Hanusheks, 1997a); others support small class size setup (Borden & Burton, 1999; Arias & Walker, 2004). We are of the view point that course management should be independently assessed and solutions designed in context to the environment.

In general, all forms of class settings require some specific management styles although overlaps are inevitable. However, not paying due attention to critical class management strategies can lead to misapplication of resources or not committing enough of the same to areas of exceptional importance. Initial evidence of inappropriate management styles include: the lack of systematic organisation of course materials, demotivated students, failure to maintain quality of learning and discrepancies in developing authentic assessment tasks. Many of these challenges appear to be magnified quickly within large solo groups. This is largely because large classes lead to increased diversity complexities, promotes social distance and subsequent reduced frequency of feedback (Sax, 2002). Bligh (1972) found that students who interacted in class with the instructor and peers reported higher levels of learning satisfaction. This view was supported by Kulik & Kulik (1979) and Keup & Sax (2002).

With reduced personal contact between staff and students, intervention in form of compensational lectures or tutorials is inevitable. It is hence not sufficient to simply increase what we do for smaller classes. Although there is indication that students are less likely to achieve higher-order learning goals in larger classes (McKeachie, 1999); this challenge may be remedied through innovative modification of teaching strategies to actively engage students.

In terms of costing, there is a concern that university faculties often devote less money per head to students in large first-year courses than in smaller later-year courses. This is commonly reflected in the intentional unwillingness by universities to support casual or sessional staff (Gappa & Leslie, 1993; Husbands and Davies, 2000; Langenberg, 1998). In Australian universities, there is an increasing recognition that sessional staff members interact with students more often and therefore need to be supported (May, 2013).
A knowledge economy and a changing labour market demand that universities provide appropriate education and ensure that graduates emerge with enhanced skills and abilities. As such, innovative approach to classroom management and strategies of knowledge impartation is critical.

Background of the Problem

We premised this research on a first-year basic business statistics course at a tertiary institution in Namibia and analysed the seminal approaches of course management opted. The course had 460 students which were subdivided into five groups. The main reason for subdividing was that the institution did not have enough high capacity lecture theatres to readily accommodate everyone. To a certain extent, *alternative teaching* was also practised in which one teacher

took responsibility of one large group while the other teachers worked with smaller groups, depending on the venues for that day. Each group had a lecturer with relatively the same qualifications and all lecture rooms had similar settings in terms of facilities and teaching aids such as projectors and white boards.

In aiming to reach for a consistent and high-quality course management, the lecturers addressed each of the primary causes of course quality in common: time, exercise-and assessment styles. Other, secondary and more personal causes of course quality such as individual actors, content delivery methods were addressed adrift. This is expected especially in tertiary institutions with fairly advanced approaches of promoting academic autonomy as also purported by Herbert, Joyce, & Hassall (2008). Because of the many class groups of five, employing "*station teaching*" in which a lecturer is required to teach specific components of course material to different groups seemed not sustainable for BBS111S.

Controversies over the quality and hence the learning outcomes in BBS111S have been increasing due to high student failure rates. Students normally take BBS111S because it is an institutional core courses. This, and typically like any first-year introductory course result in large student enrolment. The same problem was experienced in other departments where students were allowed to take optional courses from. Consequently, that cannot be fitted in one or two lecture theatres. To manage this scenario, the department of mathematics and statistics split the class into smaller groups which are subsequently allocated to different lecturers. This seems to be an application of a good concept to a wrong situation because multiple lecturers in a course are usually utilized within the same course in the context of alternate or station teaching which aims at delivering expert knowledge in different sections of the course.

There were also thousands of students who apparently could not graduate due to failing some of the courses which were managed in this manner. Regardless of the opinions of proponents and opponents of the grouping strategy, managing basic statistics in this way has been daunting probably because it is a statistics course in which learning efforts need to be complimented by practice and well guided numerical instructions across the groups. Without this, students are likely to experience hopelessness as they deal with numerous concepts and a combination of logic as well as inference. This is exactly what begs the question: how can lecturers in multiple-groups statistics course achieve greater programme consistency without increasing their preparation time but still ensure that each of the groups are motivating and challenging?

Graham & Donaldson (1999) noted that younger students interacted primarily with peers and in peer-related activities, which older students were less involved in. Despite this trend, older students demonstrated equal or greater intellectual growth than younger students. This was also observed by Carney-Crompton & Tan (2002). It implies that despite the extra curricula activities older

students get engaged with such as caring for their families, they are more motivated compared to younger students. This raises a question that: do younger students need a higher threshold of motivation to pass Mathematical and Statistics courses?

Activities surrounding basic statistics courses

In business statistics courses, students often and correctly approach learning in the context of life application. While this is generally the intention of service courses, statistical courses on the other hand require deepened theoretical understanding prior to any experiential learning or meaningful application. Premising such a course on assumptions of immediate easy applications delineates students from a correct path of learning and would lead to frustration when application cannot be easily found. In any case, a firm grounding in Mathematical or Statistical principles is a precursor to deepened logic construction and subsequent intellectual growth. By making connections to existing broad-based knowledge schemas, students can integrate new learning with various life roles in a more multidimensional way (Donaldson, 1999). We believe that the vast knowledge students are expected to assimilate and readily apply to solve real world problems poses a big challenge. Besides, Namibia is one country with high secondary mathematics and science deficiencies, ranking 126 out of 144 countries under the global competitiveness report of 2014 to 2015 (5th Economical Pillar).

Method

A case study of basic business statistics course was used in the research of parallel teaching at the university understudy. During the study, instructors shared the student marks with the researchers. One of the researchers was in fact the coordinator of the course.

This research employed a mixture of qualitative and quantitative analyses. Initial qualitative analyses were conducted using Atlas Ti, which uses grounded theory techniques (Baskerville & Pries-Heje, 1999). For this part, primary documents were created from which textual content was conducted and tabulated in Table1. By synthesising data in themes, an abstraction level of second order was achieved (super codes). This was to explore the main factors characterising the teaching and learning strategies at the University. It was also used to identify possible structural problems to course delivery. For the quantitative part, the assessment marks were first captured in Excel and later exported to SPSS for analysis. The main objective for the quantitative analyses was to provide facts about the differences in assessment results. A two way ANOVA was conducted to explain for possible differences between class groups (Montgomery (2001) with respect to assessments.

Qualitative Results

Teaching and Learning

Captured in table 1 below are the super code frequencies of how lecturers responded to obstacles in teaching and learning.

Table 1: Teaching and learning

	TL1		TL2		TL3	
Super Codes	Occurrences	Frequency	Occurrences	Frequency	Occurrences	Frequency
Demonstration	6	8%				
Facilitation	15	20%				
Interaction	16	22%				
Teaching	24	32%				
Class size			6	12%		
Tools			13	26%		
Level of students is low			9	18%		
Infrastructure			7	14%		
Lack of Feedback			5	10%		
Materials are shared					11	58%
Shared Experiences					7	37%

	TL4		TL5	
Super Codes	Occurrences	Frequency	Occurrences	Frequency
Group Discussions	24	61%		
Interactions	9	23%		
Scenarios	4	13%		
Language Barrier			5	29%
Level of Student is Low			3	18%
Infrastructure			4	24%

TL1 (**What class approach are you using**) revealed that teaching as opposed to facilitation was still the most predominant way of conducting classes at the institution (32%). However, there was a tremendous shift as lecturers were rapidly moving towards student centeredness "interaction" (23%) and facilitation (20%) as a mode of conducting classes. This can be explained partly by the emphasis on student centeredness by top management at the university. A large number of lecturers were however, caught in between **facilitation and**

teaching (interaction) which can be partly explained by lack of facilities or methodology, and other factors important to implementing full **flagged student centeredness mode.**

TL2 (**What are the impediments in your delivery of cause material**) revealed that the lack of tools to use in lecturer delivery was a major impediment (26%). This included projectors and **access to internet**.

Level of students {*prior knowledge*} (18%) was also perceived to be low, meaning that students who were admitted in some courses would not comprehend or understand lecture materials due to their educational background. It could also mean that the courses were not paged at the right level and therefore the content was too much for the students. This may have led to the other factors (lack of **feedback from students** (10%) which underscored, in general, the lack of response from students.

Infrastructure (14%) was also a strong indicator of the impediments faced by lecturers in course delivery. Some classes were far-spaced and students walked from one campus to another resulting in loss of time. Smaller classes with large number of students (12%) are also major impediments because students run out of sitting space. When students are divided into smaller groups and taught by different lecturers, it can again cause problems as **coordination is very hard to archive**, in terms of fair setting of tests and exams as well as consistency in content delivery. An arguably better approach is for students to be taught by one lecturer and the rest can be tutors/makers.

TL3 (**What methods do you employ to manage bigger classes that are shared**) revealed that lecturers shared materials (58%) and also shared experiences (37%). This is however very difficult if they (lecturers) have huge workloads.

From Table 2 below: under TL4 (**The best ways to handle large classes**) revealed that lecturers, mostly relied on group discussions (61%). They also somehow interacted with students (23%) and further used scenarios (13%) for discussion. This may imply that group assignment was predominant. However, this needs to be investigated further. Table 2 under TL5 (**Some of the major problems lecturers faced in their classes**) revealed that **language** was the major barrier to knowledge delivery (29%). This means that a lot of students had difficulties in writing constructive English and hence they were unable to express themselves accurately. Infrastructure (24%) and the level of students (prior knowledge) (18%) were still predominant on this construct.

Quantitative results

Average mark of students under each lecturer: A, B, C, D and E.

Table 2: Average marks

	Summary of test_mark		
Lecturer	Mean	Std. Dev.	Freq.
Lecturer A	60.557692	17.868159	52
Lecturer B	38.607143	16.749437	28
Lecturer C	46.611765	12.870318	85
Lecturer D	56.782609	16.757513	23
Lecturer E	49.822222	14.044395	225
Total	50.140436	15.54791	413

Table 2 above indicates that the average marks of students were affected in some way by the group in which they belonged to and that included the lecturer who was instructing them as well as marking their work. The interesting part in this regard is that the test was standardised and included all the topics that each of the lecturers had covered in their respective classes. An average mark of 60.56 compared to 38.61 seems too large only to be explained by the difference in intellectual capacity of students in the different groups thus there must be other reasons for such vast discrepancies amongst the groups who were enrolled on the bases of the same qualifications. To further determine some of the possible causes of variation in the marks, a two-way analysis of variance was carried out and the results are shown below.

Table 3: TWO-way ANOVA for student marks

Source	**Partial SS**	**df**	**MS**	**F**	**Prob> F**
Model	**11463.3591**	**4**	**2865.83976**	**13.27**	**0.0000**
modecode	**4867.97372**	**1**	**4867.97372**	**22.54**	**0.0000**
Lecturer	**9677.89607**	**3**	**3225.96536**	**14.93**	**0.0000**
Residual	**88132.4957**	**408**	**216.011019**		
Total	**99595.8547**	**412**	**241.737511**		

Table 3 above indicates that there was a significant difference in the marks lecturers awarded to their students. Furthermore, the effect of mode (modecode) of study different students were using for their study was also significant. This result highlights the complex nature of the problem and calls for a holistic look

into these multi-faceted challenges that students were encountering in taking up this and other courses which were offered in the same way. To further analyse the differences between lecturers' effect on the mark of their group of students, some post-hoc comparisons were done and results are shown below.

Table 4: Multiple Comparisons for lecturer differences

Dependent Variable: test_mark

LSD

(I) Lecturer	(J) Lecturer	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Lecturer A	B	21.951*	3.445	.000	15.18	28.72
	C	13.946*	2.588	.000	8.86	19.03
	D	3.775	3.680	.306	-3.46	11.01
	E	10.735*	2.261	.000	6.29	15.18
Lecturer B	A	-21.951*	3.445	.000	-28.72	-15.18
	C	-8.005*	3.202	.013	-14.30	-1.71
	D	-18.175*	4.136	.000	-26.31	-10.04
	E	-11.215*	2.945	.000	-17.00	-5.43
Lecturer C	A	-13.946*	2.588	.000	-19.03	-8.86
	B	8.005*	3.202	.013	1.71	14.30
	D	-10.171*	3.454	.003	-16.96	-3.38
	E	-3.210	1.871	.087	-6.89	.47
Lecturer D	A	-3.775	3.680	.306	-11.01	3.46
	B	18.175*	4.136	.000	10.04	26.31
	C	10.171*	3.454	.003	3.38	16.96
	E	6.960*	3.217	.031	.64	13.29
Lecturer E	A	-10.735*	2.261	.000	-15.18	-6.29
	B	11.215*	2.945	.000	5.43	17.00
	C	3.210	1.871	.087	-.47	6.89
	D	-6.960*	3.217	.031	-13.29	-.64

*. The mean difference is significant at 0.05 level.

The table above shows comparisons between lecturers' marks for their groups of students. There is a significant difference between lecturers (A, B; 21.951*), (A, C; 13.946*), (A, E; 10.735*), (B, C; 8005*), (B, D; 18.175*), (B, E; 11.215*), (C, D; 10171*) whilst there is no significant difference between lecturers (A, D; 3.775), (C, E; 3.210). A moderate different result was however recorded between (D,E; 6.960*).

Comparison between performance of part-time and full-time students

Table 5: Comparison based on mode of study

two-sample t test with equal variances						
Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Part time	103	53.74757	1.92861	19.57325	49.92218	57.57296
Full time	310	48.94194	.7830344	13.78674	47.40118	50.48269
Combined	413	50.14044	.7650626	15.54791	48.63652	51.64435
diff		4.805637	1.754475		1.356774	8.254501

diff = mean(Part_tim) - mean(Full_tim)		**t = 2.7391**
Ho: diff = 0		degrees of freedom = 411
Ha: diff < 0	**Ha: diff != 0**	Ha: diff > 0
Pr(T < t) = 0.9968	**Pr(T > t) = 0.0064**	Pr(T > t) = 0.0032

Table 5 above indicates that there was a significant difference (t = 2.7391) in performance between part-time and full-time students. This result shows that, in spite the notion that full-time students have more peer interaction on campus and probably more time to study; they lack seriousness in doing their school work. It further highlights an assumption that part-time students have certain life experiences that make them serious with studies despite the many responsibilities they face at work and home, including caring for their families.

Discussion

Although the problems of handling large classes can be daunting, the difficulties in running multiple groups with multiple lecturers can even be worse especially were autonomy supersedes basic control. While smaller groups notion is not a problem on its own (Borden & Burton, 1999; Arias & Walker, 2004), concrete planning and superior coordination is prologue to success. Coordination may include increased consultation, while planning would underpin resource allocation, effective use of technology, engaging senior lecturers who have prior knowledge and experience in managing complex course delivery in multiple groups.

It was interesting to note from the qualitative finding that 58% claimed to share teaching material and only 37% agreed to shared experiences which clearly shows a lack of the actual experiential learning between staff members. This may mean that lecturers in these multiple groups actually did not share much as interaction with students was also very low (23%) and yet the essence of having smaller groups is to encourage interaction which is the main facet of student centeredness. Such lapses could have led to significant differences in average

marks between groups. Worse still, differences in individual paper mark reveals a much more structural problem in running multiple groups at the institution. Such differences may boarder on lecturer attitudes which may pose even a deeper problem. A more rational approach would to specifically train lecturers running such groups on a combination of topics such as academic ethics, class psychology, interpersonal and even communication skills. However, more research can be conducted in this area.

A shift from multi groups to large classes is much less complex in terms of standardised lecture delivery, but effective course management would require well organized tutoring system as well as coordinated marking schemes. Research, however provides evidence that reduced class sizes, especially in introductory courses improves student achievement to, for example, minority students (Finn, Achilles & Molnar et al, 1999). In the case of Namibia, this contextual dimension may be a critical component to the success of any mode of class management style. This is largely because Namibia has one of the largest Gini coefficient in the world, at .74 in 2014 (Inequality index, 2014). With qualitative analysis indicating that prior knowledge was lacking among students, experiential learning is one context that cannot be neglected. The differences in average mark between full-time and part-time highlight the importance of career guidance. Full time students are likely to be more serious with school work if they are given comprehensive career guidance and some form of work experience through student-internship. Differences in average marks between on campus and distance students can to some extent be caused by allowing the two groups siting for the same examination as they do not get the same exposure throughout the semester. This is an indication of another a serious problem.

Recommendations

Discrepancies in course management should always be identified and resolved quickly and effectively. Lapses will always occur but a learning institution should be in a better position to come out of these problems and adapt without disadvantaging or taking out a hope of quality education from the students in the process. Knowing the advantages and cost of implementing any of the strategies is a precursor to success. At present, the institution would do much better to run large classes if the course coordination and teacher training in class management proves to be unattainable, especially with less resources. Where multiple groups are unavoidable, station teaching should be encouraged.

References

Achilles, C. M (1990). Answers and questions about class size: A state wide experiment. American Education Research Journal, 27, 557-577.

Astin, A.W. (2001). The Kellogg Forum on Institutional Transformation in Higher Education: What have we learned? Monograph. Washington, DC: American Council on Education

Baskerville, R., & Pries-Heje, J. (1999). Grounded action research: A method for understanding IT in practice. Accounting, Management and information Technology, 9(1), 1-23.

Beidatsch, C (2007) Alternatives to the traditional tutorials: a report on workshop based experiential learning in the History Discipline at the University of Western Australia, in Student Engagement: Proceedings of the 6th Annual Teaching and Learning Forum, 30-31 January 2007. Perth: University of Western Australia, http://otl.curtin.edu.au/tlf/tlf2007/refereed/beidatsch.html.

Bligh, D. A. (2000). What's the use of lectures? (1st U.S. edition). San Francisco: Jossey-Bass

Burridge, M and Oztel, H (2008), investigating the relationship between student achievement and e-learning: The case of an undergraduate strategic management model. International journal of management education, 7(1),3-11

Bradley, D, Noonan, P, Nugent, H and Scales, B (2008) Review of Australian Higher Education, Final Report Canberra: Department of Education, Employment and Workplace Relations

Carney-Crompton, S. and Tan, J. (2002).Support systems, psychological functioning, and academic performance of non-traditional female students. Adult education quarterly, 52(2)140-154. Economical Pillar (www.aigroup.com.au)

Graham, J. and Donald, S. (1999) "Adult undergraduate students: How do they define success? American Education Research Association

Herbert, W., Joyce, J and Hassall, T (2008), "Business performance measures and management", 73(1)pp 404-446

Kerr, A. (2011). Teaching and learning in large class at Ontario Universities: An exploratory study. Toronto: Higher Education Quality Council of Ontario

Keup, J.R., & Sax, L.J. (2002). Findings frpm the 2002 Your First College Year (YCY) report. [http://www.gseis.ucla.edu/heri/yfcy]

Kulik, J.A., & Kulik, C.L.C(1979). College teaching. In P.L. Peterson & H.J. Walkberg(Eds), Research on teaching: Concepts, findings and implications. Berkeley, Califonia: McCutcheon

Nordberg, D (2008), " Assessment and evaluation in higher education" 33(5),481-492. http://www.indexmundi.com/namibia/economy-profile.html(17.2.2014)

McKeachies, W (1999) Teaching Tips: Strategies, Research and Theory For College And University Teachers. Boston: Houghton Mifflin Co

McLeod, N. (1998). What teachers cannot do in large classes (Research Rep. No 7). Leads, UK: Leeds University.

Montgomery, D.C (2001). Design and analysis) of Experiments (5th Ed.) John Wiley & Sons Inc., New York

Tessema, K. A. (2009). The unfolding trends and consequences of expanding higher education in Ethiopia: Massive universities, massive challenges. Higher Education Quarterly, 63, 29-45.

UNESCO. (2010). Trends in tertiary education: Sub-Saharan Africa. UIS Fact Sheet, December 2010, No. Retrieved from http://www.uis.unesco.org/FactSheets/Documents/fs10-2010-en.pdf.

Yizengaw, T. (2008). Challenges of higher education in Africa and lessons of experience for the Africa-US. higher education collaboration initiative: A synthesis report for the Africa-U.S. higher education initiative. Retrieved July 21, 2013, from http://www.aplu.org/NetCommunity/Document.Doc?id=1183.