

# Botswana's tertiary educators perception of instructional media in tertiary students' conceptualization of intended learning outcomes

Authors: Gweshe Murombo Anold<sup>1</sup>; Professor Prem Jotham Heeralal Heeralal<sup>2</sup>

BA ISAGO University1, University of South Africa (UNISA)<sup>2</sup>

[anorld.gweshe@gmail.com](mailto:anorld.gweshe@gmail.com)<sup>1</sup>, [heeralalpj@unisa.ac.za](mailto:heeralalpj@unisa.ac.za)<sup>2</sup>

## Abstract

The purpose was to find out the perceptions of Botswana tertiary educators on the role of instructional media in teaching and learning. The objective of this study was, "To examine and describe the effectiveness of instructional media in the conceptualization of intended learning outcomes at tertiary level of education." This research objective sought to find out and describe the current practices in instructional media use, and how educators (Lecturers/tutors) view instructional media's effectiveness in conceptualization of intended learning outcomes. The study used a survey method and employed probability sampling procedures-multi stage sampling; using systematic sampling technique and this was done to increase the degree of representativeness. The target respondents were the educators in these tertiary institutions. A total of 300 respondents were sampled and issued with questionnaires. 183 questionnaires were returned, constituting 61% return rate. It was found out that 81.7% of respondents used instructional media during the **actual** teaching and learning. The extent and frequency of utilizing instructional media were influenced mostly by lack of resources. It was concluded that the general perception of Botswana tertiary educators, on the effectiveness of instructional media was instructional media enhanced conceptualization of intended learning outcomes, and therefore tertiary educators used instructional media during teaching and learning process. The study recommends that a policy formulation is needed to cater for financing, procurement and use of instructional media in tertiary institutions; since the extent and frequency of utilization of instructional media is affected by among other factors; availability of resources.

## Key words

**Perception, instructional media, tertiary students, tertiary educators conceptualization.**

## 1.0 Introduction

The instructional media effect schools of thoughts Centre on, whether, instructional media do influence academic achievement or not? There are two dialectically opposite perceptions on the effectiveness of instructional media in conceptualization of intended learning outcomes, thus the positive and the negative perceptions. The origins of these perceptions is the debate started when Richard Clark's article published in 1983 down played the role of media to a mere delivery mechanism (Moffat 2013:1). Ten years later, Kozma wrote a rebuttal to Clark's contention thus began the debate of media versus method (Moffat 2013). This debate, brought two schools of thought on the effectiveness of instructional media in academic achievement, thus the origins of dialectically opposing perceptions, when Kozma in 1994, opposing Clark contended that, Instructional media itself can influence teaching and learning under certain conditions and with proper process. Whereas, on the other hand, Clark in 1994, argued that; "it is the method rather than media that influences academic achievement." (Marx. 2006:02). The basic idea of Clark's perception is that teaching methods have the most influences on learning. Instructional media is merely a delivery device and has no significant difference in learning outcomes (Moffat 2013). Clark (1983) argues that, the media comparison studies do not acknowledge other confounding variables such as the method, the teacher, the content and the environment; which play a significant role in teaching and

learning process. Thus Clark (1983:445), concludes, "The best current evidence is that media are mere vehicles that deliver instruction but do not influence students achievement any more than the truck that delivers our groceries causes changes in our nutrition." Clark (1983:456), argues, further that "All current views of media comparison studies suggest that we will not find learning differences that can unambiguously attributed to any medium of instruction. It seems that existing research is vulnerable to rival hypotheses concerning the uncontrolled effects of instructional method and novelty." On the other hand, Kozma (1994) contends that, the studies, carried out which Clark (1983) refers to, failed to establish a relationship between instructional media and learning because the theories, research and designs have been constrained by vestiges of behavioral roots from which the discipline of education sprang (Kozma 1994:2). In other words, Kozma (1994) disputes the findings and the conclusions by Clark 1983, that they were flawed, which is the reason why they failed to establish the relationship between instructional media and students' conceptualization of intended learning outcomes. Kozma (1994)'s main argument is that media and methods are extricably interconnected. Because the method that one adopts in the teaching and learning process has a bearing on the instructional media that is going to be employed during instructional delivery. This connectivity is the cornerstone of Kozma's argument that one cannot separate instructional method from instructional media. Thus, Kozma (1994:3) asserts that, "We will understand the potential for a relationship between media and learning when we consider it as an interaction between cognitive processes and characteristics of environment". In this case, Kozma transcends the idea that, it is the cognitive domain that matters when it comes to learning, but that, the environment plays a significant role in the teaching and learning process.

## 2.0 Literature review

The debate between Kozma and Clark produced two schools of thought (perceptions) on the effectiveness of instructional media; that is the positive perception and the negative perception. It is therefore imperative to examine and describe the perceptions on the role of instructional media in tertiary students' conceptualization of intended learning outcomes.

The positive perception school of thought claims that, instructional media influence academic performance of students. This means that, learners who are exposed to instructional media learn more and perform better academically than those who are not exposed to instructional media, in other words, instructional media enhance conceptualization of intended learning outcomes. There are several researchers, such as Isiaka (2007), Bada (2011), Gulek and Demirtas (2005), that support this school of thought. Rutz, Eckart, Wade, Maltbie, Rafter and Elkins (2003), found that instructional media influence academic achievement of students, when they evaluated the final grades, in their study to compare technology-enhanced and traditional instruction for a course in statistics. They found out that the Web assisted instruction mean of 76.1 compared to Traditional instruction at 67.8 percentage point. The mean difference is at 8.3 percentage point, showing significant difference between the means of those students taught using technology enhanced instruction and those taught using the traditional instruction. These findings, are in agreement with the results of Peake, Briers and Murphy (2005) who collected data on the relationship between student achievement and the level of technology integration by Texas agriculture teachers, and found that, "while there are no cause and effect relationships addressed in the study, the findings support that a positive relationship exists between the level of agriculture science teacher technology integration and students achievement in basic academic subjects" (2005:29). Peake et al (2005) noted that while no statistically significant correlations were found at the inferential level for these variables, there were some "descriptively significant" correlations in this sample. The purpose of their study was to determine if a relationship existed between agriculture science teacher integration of instructional media and students' achievement. In short the strong media school of thought support instructional media in teaching and learning process as it seen to enhance conceptualization of intended learning outcomes. This means that the perception of this school of thought is instructional media enhance conceptualization of intended learning outcomes amongst learner.

The negative perception school of thought purports that media do not influence academic achievement or conceptualization of intended learning outcomes. In other words, there are no academic achievement benefits for using instructional media, and there is no distinction in terms of performance between those students who receive instruction with instructional media and those without instructional media. Cradler and Brighforth, (2005:3) assessed over 100 research findings, and found that ".....studies generally and consistently show that technology alone does not have significant effect on teaching and

learning.” Although Marx (2006) and ISTE (2008) support the strong media school of thought, as noted earlier, they too contend that instructional media are effective in conceptualization of intended learning outcomes, if they are supported by other factors of teaching and learning process. This then, is the basis of the argument of the theorists in the negative perception school of thought, that instructional media alone cannot be the only factor in the teaching and learning process, which can be attributed to the gain in learning, because teaching is a complex social interaction, stemming from various factors or activities. In this regard the weak media effect school of thought holds that instructional media do not enhance conceptualization of intended learning outcomes. The perception in this school of thought is that instructional media do not enhance conceptualization of intended learning amongst learners, especially when it is used alone without other factors of teaching and learning process.

### 3.0 Statement of the problem & research objective/questions

Hair, Bush and Ortinau (2002:72), state that, “Research objectives are precise statements of what a research project will attempt to achieve...” The objective of this study was, **“To examine and describe the effectiveness of instructional media in the conceptualization of intended learning outcomes at tertiary level of education.”** This research objective sought to find out and describe the current practices in instructional media use, and how educators (Lecturers/tutors) view instructional media’s effectiveness in tertiary students’ conceptualization of intended learning outcomes in Botswana. In order to achieve the objective, the study had the following research question:

What are the perceptions of educators about the extent and frequency of utilizing instructional media at tertiary level of education?

### 4.0 Methodology

#### 4.1 Research design

This study used the quantitative research design. Leedy and Ormrod (2010:94) explain that; “quantitative research involves looking at amounts, or quantities, of one or more variables of interest.” This study followed the survey method, which Leedy and Ormrod (2010:187) describe as involving acquiring information about one or more groups of people—perhaps about their characteristic, opinions, attitudes, or previous experiences— by asking them questions and tabulating their answers. The survey method is appropriate to this study because by its nature, it is one of the best ways to find the opinions or perceptions of tertiary educators on tertiary students’ conceptualization of intended learning outcomes in Botswana. A structured questionnaire was used, of which, questions 1 to 8 of the questionnaire apply to this topic: **Tertiary educators’ perceptions of the effectiveness of instructional media in conceptualization of intended learning outcomes.** A total of 300 questionnaires were sent out, of which 183 questionnaires were returned and was considered to be sufficient for this study, following a cue from Babbie (1997)’s mark of 60% return rate on survey questionnaires which is considered to be good for research purposes (Babbie 1997). Thus the return rate for this study was 61%.

#### 4.2 Population and Sampling

The population comprised of all tertiary institutions in Botswana registered and accredited by either Botswana training authority (BOTA) and or by Tertiary Education Council (TEC). By 2010, BOTA had registered 284 training institutions (10<sup>th</sup> anniversary commemorative brochure page 12) and TEC 36 institutions (TEC student directory 2011/2012:23). The target respondents were the educators in these tertiary institutions and those who hold positions of responsibilities such as Principals, Vice principals, Deans, Campus managers, Coordinators, Centre Managers, Heads of departments, et cetera. BOTA had 3280 accredited trainers (World TVET Database Botswana 2012:12).

This study used probability sampling procedures—multi stage sampling; using systematic sampling technique and this was done to increase the degree of representativeness and heterogeneity in the sample for generalization purposes. A total of 300 respondents were sampled.

### 4.3 Data presentation and analysis

The data was presented in table and graphic forms, for comparison purposes. The Objective of the study was to examine and describe the effectiveness of instructional media in the conceptualization of intended learning outcomes at tertiary level. In order to meet this objective, the second research question was phrased in order to fully address the concerns of objective as follows: What are the perceptions of educators about the extent and frequency of utilizing instructional media at tertiary level of education? This research question required respondents to give the extent and frequency of instructional media usage, in tertiary students' conceptualization of intended learning outcomes. To answer this research question, a number of question items were formulated, from question 5 to question 8 of the questionnaire.

Question 5 was presented as follows: To what extent do you use instructional media during the teaching and learning process, in your institution?

This question required respondents to indicate the degree or level of instructional media usage in the teaching and learning process in the respondents' respective institutions. The respondents provided the following information in Table 4.3.1

**Table 4.3.1: To what extent do Respondents used instructional media**

EXTENT OF INSTRUCTIONAL MEDIA USE	FREQUENCY	PERCENT	VALID PERCENT
Greater extent	52	28.4	29.4
Lesser extent	56	30.6	31.6
Not sure	11	6.0	6.2
Not often	33	18.0	18.6
Rarely	25	13.7	14.1
<b>Total</b>	<b>177</b>	<b>96.7</b>	<b>100.0</b>
Did not indicate extent of instructional media use	6	3.3	
<b>Total</b>	<b>183</b>	<b>100.0</b>	

Looking at the valid percentages, 61% of respondents in Botswana said they used instructional media during teaching and learning process from **lesser extent** to **greater extent** in their institutions. 6.2% were not sure, and 32.7% of respondents said they do **not often** use instructional media during teaching and learning process in their institutions. It was concluded that instructional media is used during teaching and learning process in Botswana from **lesser extent** to **greater extent**.

Question Six (6), was fashioned as follows: How often do you use instructional media during the actual teaching and learning process? The purpose of this question required that the respondents give qualitatively their individual frequencies of using instructional media in the **actual** teaching and learning process in their lessons/lectures, as qualifying the extent (*see question five 5 above*). The following table 4.3.2 presents the actual use of instructional media by respondents in teaching and learning process at tertiary education in their institutions.

Table 4.3.2: How often do respondents use instructional media?

HOW OFTEN THEY USED INSTRUCTIONAL MEDIA	FREQUENCY	PERCENT	VALID PERCENT
Always	25	13.7	14.4
Very often	41	22.4	23.6
Not sure	8	4.4	4.6
Sometimes	76	41.5	43.7
Seldom	24	13.1	13.8
<b>TOTAL</b>	<b>174</b>	<b>95.1</b>	<b>100.0</b>
did not indicate how often they use instructional media	9	4.9	
<b>GRAND TOTAL</b>	<b>183</b>	<b>100.0</b>	

The table 4.3.2 above showed that the valid percentages indicated that 38% of tertiary educators in Botswana actually used instructional media in their lectures **very often** to **always**, during teaching and learning process in their lessons. 4.6% were not sure. 43.7% of the respondents used **sometimes** instructional media during the actual teaching and learning process in their lessons. 13.8% **seldom** used instructional media during the actual teaching and learning process in their lessons.

81.7% of tertiary educators in Botswana used instructional media during the actual teaching and learning process from **sometimes**, to **very often** and **always** in tertiary students' conceptualization of intended learning outcomes. Whilst 13.8% **seldom** used instructional media in tertiary students' conceptualization of intended learning outcomes during the actual teaching and learning process.

Question Seven (7) was also phrased as a follow up to question six above. This was how question seven was crafted: From your response in question 6 above, how many times do you actually use instructional media during teaching and learning process?

This question sought to find out the quantitative or actual number(s) the respondents utilized instructional media during the teaching and learning process. The following Table 4.3.3 presents the actual use of instructional media.

Table 4.3.3: How many times respondents actually used instructional media?

TIMES DO YOU ACTUALLY USE INSTRUCTIONAL MEDIA	FREQUENCY	PERCENT	VALID PERCENT
Every lecture	25	13.7	15.6
Once/twice a week	23	12.6	14.4
When appropriate	90	49.2	56.3
Once/ twice a fortnight	5	2.7	3.1
Once/twice a month	17	9.3	10.6
<b>TOTAL</b>	<b>160</b>	<b>87.4</b>	<b>100.0</b>
Did not indicate how many times.	23	12.6	
<b>GRAND TOTAL</b>	<b>183</b>	<b>100.0</b>	

Valid percentages indicated that 30% of respondents use instructional media **every lecture to once /twice a week**. 56.4% of respondents use instructional media **when appropriate**. 13.7% of the respondents use instructional media **once/twice a fortnight to once/twice a month**. It was then concluded, that instructional media was used by 100% of respondents between every lecture and to when was appropriate.

The next question was question eight (8), presented by the researcher as follows: Give reason(s) for the responses given in questions 5, 6 & 7. This question required that the respondents give reasons for their chosen responses to question (5) “what extent do you use instructional media during the teaching and learning process, in your institution?” Question (6) “How often do you use instructional media during the actual teaching and learning process?” and question (7) “From your response in question 6 above, how many times do you actually use instructional media during teaching and learning process?” Table 4.3.4 presents the reasons given by respondents for their responses to questions 5, 6 & 7 below.

**Table 4.3.4: Respondents reason(s) for responses in questions 5, 6 & 7**

REASON(S) FOR TO WHAT EXTENT, HOW OFTEN, HOW MANY TIMES THEY USE INSTRUCTIONAL MEDIA DURING TEACHING & LEARNING PROCESS.	FREQUENCY	PERCENT	VALID PERCENT
Effective teaching/ making understanding better/ make easier communication	36	19.7	29.3
No resources	61	33.3	49.6
Depends on objective, topic, accessibility of resources	18	9.8	14.6
Students do not require instructional media	8	4.4	6.5
<b>TOTAL</b>	<b>123</b>	<b>67.2</b>	<b>100</b>
Did not indicate the reason(s)	60	32.8	
<b>GRAND TOTAL</b>	<b>183</b>	<b>100</b>	

The table 4.3.4 showed valid percentage, 29.3% of the respondents indicated that the extent they used media, how often they used media and the number of times they actually used media in the teaching and learning process, the reasons were **effective teaching and making understanding of the concepts better**. 49.6% of the respondents indicated that the reason for their chosen responses was **lack of resources** in their institutions. 14.6% of the respondents showed that the reasons were the use of instructional in the teaching and learning process **depended on the objectives, topic, and or accessibility to resources**. 6.5% of the respondents indicated the reason was **student do not require instructional media**.

It was concluded that the extent and frequency of using instructional media in tertiary students’ conceptualization of intended learning outcomes in Botswana were influenced by the following factors: lack of resources (49.6%), effective teaching and making concepts understood better (29.3%) and those tertiary students do to require instructional media (6.5%).

## 5.0 Findings

The objective of this study was, “**To examine and describe the effectiveness of instructional media in the conceptualization of intended learning outcomes at tertiary level of education.**” This objective had one research question. The findings were as follows:

### 5.2 Research question one (1)

61% of respondents used instructional media during teaching and learning process. 81.7% of respondents used instructional media during the **actual** teaching and learning process. 43.7% of the respondents used instructional media every lecture to once/twice a month. 56.4% of respondents used instructional media when appropriate.

The extent and frequency were influenced by the following factors: lack of resources (49.6% of respondents), effective teaching and making concepts understood better (29.3% of respondents).

## 6.0 Discussion

The objective of this study was, “**To examine and describe the effectiveness of instructional media in the conceptualization of intended learning outcomes at tertiary level of education.**”

Research question , had the following findings: 61% of respondents in Botswana used instructional media during teaching and learning process from **lesser extent to greater extent** against 32.7% of respondents who **rarely to not often** used instructional media during teaching and learning process. 81.7% of respondents in Botswana used instructional media during the actual teaching and learning process against 13.8% of respondents who **seldom** used instructional media during the actual teaching and learning process. 43.7% of the respondents used instructional media every lecture to once/twice a month, and 56.4% of respondents used instructional media when appropriate, in tertiary students’ conceptualization of intended learning outcomes during teaching and learning process. The extent and frequency of using instructional media in tertiary students’ conceptualization of intended learning outcomes were influenced by the following factors: lack of resources (44.9%), effective teaching and making concepts understood better (38.1%). The “Only” instructional media available (10.2%). Those who did not indicate their reasons (6.5%).

To ascertain the reliability and consistency of the empirical results, the demographic variable of gender was used and statistical computations using the Pearson Correlation Coefficient software for Social Science Statistics. The purpose of this was to find out if the variable-gender influenced significantly the overall perception of the respondents on the effectiveness of instructional media in tertiary students’ conceptualization of intended learning outcomes in Botswana.

The sixteen closed ended questions were analyzed from both male and female respondents, using Pearson correlation coefficient calculator, the result details and calculation were as follows;

### **X values:**

□ □ □ □ □ □

Mean=94.812

□(x-mx)<sup>2</sup>=ssx=6216.438

### **Y values:**

□=943

Mean=58.938

□(y-my)<sup>2</sup>=ssy=12212.938

### **X and Y combined:**

N=16

□(x-mx)(y-my)=8478.812

### **R calculation:**

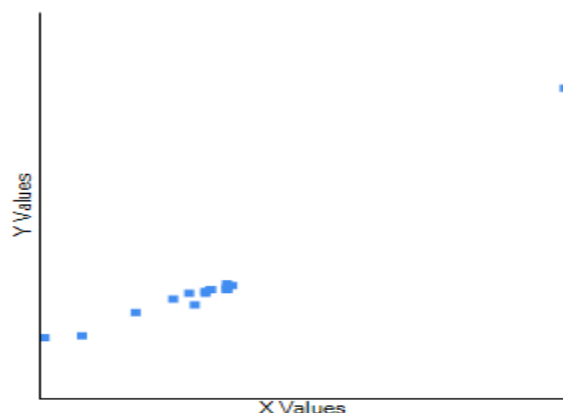
$r = \frac{\sum (x-mx)(y-my)}{\sqrt{(\sum (x-mx)^2)(\sum (y-my)^2)}}$

$r = \frac{8478.812}{\sqrt{(6216.438)(12212.938)}}$

$r = 0.9731$

**r= 0.9731**

The correlation when presented in a scatter gram looks as follows in figure 6.1below:



**Figure 4:14. Gender correlation**

**KEY: Y=Males. X=Females.**

The correlation coefficient is 0.9731. This is a strong positive correlation. The value of R showed consistence of perception in male and female responses to questions. Therefore, neither of the gender influenced the responses to the questionnaire. This is further supported by the value of R<sup>2</sup>, the coefficient of determination, which is 0.9469. Coefficient of determination according to Leedy and Ormrod (2010), "...tells us *how much of the variance is accounted for* by the correlation" (Leedy and Ormrod, 2010:273). In this case, 94.69% of responses by tertiary educators on the perceptions of the role of instructional media in tertiary students' conceptualization of intended learning outcomes is accounted for in both gender. Furthermore the significance was determined at .05 significance level, and the p-value is <0.00001, meaning that the result is significant at  $p < 0, 05$ . In this study it is concluded that gender had no influence to the overall results of this study. This is contrary to the findings of Koksai, Yaman and Saka (2016), when they carried a study to analyze Turkish Prospective Science Teachers' perceptions on Technology in Education. Their main research question was "Is there any statistically significant difference in the perception scores of the pre-service science teachers toward educational technology in terms of gender, learning styles, computer competency level and possession of a computer?" Koksai et al (2016:33) concluded that, "The main effect pointed out that the male pre-service science teachers had more positive perceptions about instructional technology than the female pre-service science teachers did. Furthermore, the interaction effect pointed out that the male pre-service science teachers who were weak in computer competency had more positive perceptions about instructional technology than the female pre-service science teachers who were weak in computer competency." However, they went on to say that based on the results of their study, it is evident that the perception of Turkish pre service science teachers who participated in this study about educational technology is positive in general (Koksai et al 2016:34). Here to a larger extent, their conclusion is consistent with the findings of this study since this study does not focus on score (percentages), but the perceptions associated with the percentages and therefore, from gender perspective of this study, the gender variable had no significant differences in general perceptions to responses given to questions from the questionnaire; as a result the findings of this study are not gender biased in perception and therefore are considered consistent and reliable.

## 7.0 Conclusion

Empirical evidence from this study support the strong media effect school of thought, that is; instructional media plays a crucial role in tertiary students' conceptualization of intended learning outcomes. This is the general perception of Botswana tertiary educators, on the effectiveness of instructional media. Tertiary education respondents in Botswana use instructional media during teaching and learning process. Their perception was instructional media was necessary and relevant in tertiary students' conceptualization of intended learning outcomes. Further, tertiary educators in Botswana agreed to the perception that instructional media were relevant in the teaching and learning at tertiary level of education in Botswana. The conclusion for this research objective (see section 3.0 and 5.0 on objective of this study) was instructional



media were being used in the teaching and learning process at tertiary level of education; it is viewed as relevant, necessary and enhances tertiary students' conceptualization of intended learning outcomes in Botswana.

## 8.0 Recommendation

A policy formulation is needed on instructional media and teaching /learning process- since it seems there is no clear policy on financing, procurement, and use of instructional media at tertiary level of education. The policy formulation is needed to cater for financing, procurement and use of instructional media in tertiary institutions; since the extent and frequency of utilization of instructional media is affected by among other factors; availability of resources, or lack of resources and therefore, stakeholder consultation is the way to go as Botswana philosophy of "Kgotla" is paramount in all governance issues.

## References

- Babbie, E. 1997. *The practice of social research*. Belmont: Wadsworth.
- Bada, TA. 2011. Computer instructional approach and students' creative ability in sculpture education in Nigeria Universities: Obafemi Awolowo University as a case study. *World Journal of Education*. 1 (2):130-135.
- Botswana Training Authority 10<sup>th</sup> anniversary commemorative brochure. Botswana: BOTA.
- Clark, RE. 1983. Reconsidering research on learning from media. *Review of Educational Research Journal*. 53(4):445-459.
- Cradler, J & Bridgforth, E. 2005. Recent research on the effect of technology on teaching and learning. [O]. Available: <http://www.wested.org/techpolicy/research.html>  
Accessed on 2005/8/31
- Gulek, JC & Demirtas, H. 2005. Learning with technology: the impact of laptop use on student achievement. *The Journal of Technology, Learning, and Assessment* 3 (2):4-30.
- Hair, JP, Bush, RP & Ortinau, DJ. 2002. Marketing research within a changing information environment. Boston Bur Ridge: McGraw Hill Company.
- Isiaka, B. 2007. Effectiveness of video as an instructional medium in teaching rural children agricultural and environmental science. *International Journal of Education and development. Using information communication Technology*. 3(3): 105-114.
- International Society for Technology in Education (ISTE) .2008. Technology and Student Achievement-The Indelible Link. [SI: Sn].
- Koksal, M S, Yaman, S & Saka, Y. 2016. Analysis of Turkish prospective Science teachers' perceptions on technology in education. *Australian Journal of Teacher Education*, 41(1):21-41
- Kozma, R.1994. Will media influence learning? Reframing the debate. *Educational Technology Research and development*. 42 (2):7-19.
- Leedy, PD & Ormrod, JE. 2010. *Practical research, Planning and design*. New Jersey: Pearson Education.
- Marx, L. 2006. Does media influence learning: The Clark /Kozma debate? [SI: Sn].
- Moffat, D. 2013. Clark and Kozma debate is it still relevant. [O]. Available: <http://dc.moffat71.wordpress.com/2013/04/17/clark-and-kozma-debate-is-it-still-relevant/>  
Accessed on 4/6/2013
- Peake, JB, Briers, G & Murphy, T. 2005. Relationship between student achievement and levels of technology integration by Texas Agric science teachers. *Journal of Southern Agricultural Education Research*. 55 (1):19-29.
- Rutz, E, Eckart, R, Wade, JE, Maltbie, C, Rafter, C & Elkins, V .2003. Student performance and acceptance of instructional technology: Comparing technology enhanced and traditional instruction for a course in statistics. *Journal of Engineering Education*. 92(2):133-140.
- Tertiary Education Council (TEC), Students directory 2011/2012. Tenth anniversary: commemorative brochure. Botswana: Hull.
- World TVET Database Botswana. 2012. International Centre for Technical and Vocational Education and Training. Germany: UNESCO-UNEVOC.