The Influence of Humour on Learners' Attitude and Mathematics Achievement: A Case of Secondary Schools in Arusha City, Tanzania

Baraka Manjale Ngussa, PhD[1] & Elias Elisha Mbuti, M. Ed[2]

[1] Director of Graduate Studies and Arusha Extension Centre,
University of Arusha, Tanzania

[2] Associate Director of Arusha Extension Centre
University of Arusha, Tanzania
Corresponding Email: ngussathe5th@gmail.com

Abstract
While there are many factors which can contribute to success or failure in Mathematics achievement, teaching-learning strategy is an important factor which cannot be ignored. This study employed case study design to investigate the influence of humour as an instructional tool on secondary school learners' attitude and mathematics achievement in Arusha City, Tanzania. A sample of 412 Form Three students participated by filling the questionnaire. Expert judgment ensured that the questionnaire items provided useful information that corresponds to research questions. Reliability test for three variables yielded conbach's alpha between 0.73 and 0.79 meaning items in the questionnaire were reliable. Quantitative method in terms of descriptive statistics established mean scores while inferential statistics in terms of t-test and Pearson Product moment corelational coefficient tested differences and relationships respectively. The study concludes that the more the use of humour in teaching, the better the attitude and mathematics achievement. Therefore, it is recommended that Mathematics teachers should increase the use of humour while teaching in order to increase learner's interest in the subject matter and in that way improve performance.

Keywords: *Humour, mathematics, achievement, attitude, Arusha, Tanzania*

1. Introduction

Importance of Mathematics as a subject matter cannot be overemphasized. According to Role, Retrieved 2015, p. 135), "mathematics is a necessary human activity, one that reflects a response to needs dictated by human existence itself. ... *The subject* is evident in all societies and cultures." Thus, mathematics becomes a key subject in Secondary school Curriculum. According to Tella (2008) as cited in Kiplagat, Role and Makewa (2012), mathematics is recognized worldwide as the most important subject in most fields of human endeavours. Its usefulness in science, technological activities, commerce, economics, education and even humanities is almost at par with the importance of education as a whole. Adegun and Adegun (2013) also argue that mathematics is a powerful tool and gate keeper for success in life. Kemboi, Githua and Changeiywo (2014, p. 56) support the idea by holding that "Knowledge of mathematics as a tool for use in everyday life is important for the existence of any individual and society." Mefun (2014) further contends that Mathematics Curriculum is meant to give learners in both in Primary and Junior secondary schools the opportunity to acquire mathematical literacy to function in an information age and cultivate understanding of the skills necessary for the changing technical world.

In Tanzanian curriculum, Mathematics is one of seven core subjects which must be taken by every secondary school learners. According to the Ministry of Education and Vocational Training (2007), the core subjects include mathematics, English, Kiswahili, Biology, Civics,

Geography and History, yet Mathematics seems to be the most difficult subject in different parts of the world. While this is true in different parts of the globe, Tanzania is not exceptional. Results of a study in Mtwara Municipality and Ilemela District by Mabula (2015, p. 96) revealed that "the overall performance of students in Certificate of Secondary Education Examination has been steadily deteriorating in the last fifteen years. This deterioration specifically includes poor performance in mathematics such that the subject has ranked the poorest performed followed by English subject." Poor performance in mathematics in Tanzanian Secondary Schools is therefore a current issue that needs investigation in order to give necessary recommendations.

According to Ramadhan (2012, *abstract*), "poor performance of mathematics in Tanzania is a major problem especially in Secondary Schools. There are high rates of failures of this subject due to various reasons that eventually disorient student's education." In 2009, for instance, 49% of students earned their Primary School Certificate. 89.5% of passing students were selected to Public Government Secondary Schools. Of passing students 69% passed in Swahili, 35% passed English, while only 21% passed Mathematics (*Fact Sheet, Retrieved March 1, 2017*). This indicates that performance in mathematics is a big problem in Tanzania. The trend of poor performance in mathematics is further not promising as reflected in the work of Hamilton, Mahera, Mateng'e and Machumu (*Retrieved March 1, 2017*).

> Despite significant achievements in improving access to quality education in Tanzania over the past two decades, continued poor performance in mathematics and science at the primary and secondary-school levels raises concerns over whether or not the education system can supply graduates who possess the competencies required of them within the emerging technology sector.

Public Secondary Schools in Arusha City are particularly facing a serious problem in Mathematics performance at National Examinations. As seen in the appendices, a total of 4550 candidates sat for Certificate of Secondary Education Examination (CSEE) in the year 2016. Of these, only 624, which is 13.7% passed while the majority (86.3%) failed. While there are many factors which can contribute to success or failure in Mathematics achievement, teaching-learning strategy is an important factor which cannot be ignored. This is supported by the findings of Mbugua, Kibet, Muthaa and Nkoke (2012) which indicates that factors contributing to poor performance in mathematics include lack of motivation, poor attitudes by both teachers and students and retrogressive practices. A similar study by Gitaari, Nyaga, Muthaa and Reche (2013) attributed inadequate teaching force, inappropriate teaching methods and poor assessment techniques as responsible factors for poor performance of mathematics. While failure in mathematics, like in any other subject matter can be caused by teacher factor, learner factor and environmental factor, teachers often are the main contributor and have the greatest impact on achievement (Saun, 2014).

In response to this problem, the present study seeks to investigate on the Influence of humour on learners attitude and achievement in mathematics. This is because while there are many factors which can increase learning effectiveness, humour as a learning strategy is an important factor which cannot be ignored. According to Al-Duleimi and Aziz (2016, p. 105), "humour is beneficial in the classroom because it increases social bonding between teachers and students, salience of information, and ultimately recall and retention."

1.1. The Importance of Humour in Mathematics Learning

According to Wanzer, Frymier, Wojtaszczyk & Smith (2006) humour can be defined as anything that the teacher and/or students find funny or amusing. They also maintain that humour could come from either the teacher or the students, or even another source, and might be acknowledged or enjoyed by one party only. Duleimi and Aziz (2016, p. 105) argue that "humour is beneficial in the classroom because it increases social bonding between teachers and students. According to Farrant (1999, p. 210), "humour shows itself in pleasantness, cheerfulness, friendliness, a sympathetic and understanding manner toward others and balanced attitude toward events both good and bad." He adds that "a good humoured teacher does not make fun that hurt any pupil but is able to laugh at himself." This implies that humour is a powerful tool through which effective learning can be maximized.

A study conducted by Makewa, Role and Genga (2011), concluded that teachers who use humour in teaching are rated effective by the learners in terms of motivation, creation of engaging lessons and anxiety reduction. The teachers are also rated effective in terms of stimulation of thought and interest in students and fostering of a positive teacher-student relationship. The use of humour further creates a sense of friendship between the teacher and the learners, thus learners are likely to like the teacher and the subject matter. Abdi Ali, Ashur, Ghazi and Muslim (2016) contend that if students like their teachers, they will start liking the subjects taught by them and be more attentive in the class. They also quote Vijay, et al, 2014, p. 260-61) who have it that "'A strict teacher can be successful but a humorous teacher can be more successful." This suggests that mathematics teachers need to make us of humour as an instructional strategy to attract the attention of learners and increase interest for learning.

1.2. Learners' Attitude toward Mathematics

There are many ways of defining attitude. Eagly and Chaiken (1993) in Mensah, Okyere and Kuranchie (2013), for instance, define attitude as a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour. According to Busch (1995) in Victor (2013), attitudes are kind of mental processes that are thought to influence future behaviours, experiences, belief and have certain implications. According to Offor (2017, attitude is everything in learning. Particularly, it refers to predisposition or perception, or response of an individual towards an animate or inanimate object, event, subject or person among others. Olubunmi, Akinsete and Omoniyi (2013) consider attitude as a framework that affects how a person thinks and acts about the world. Mensah, Okyere and Kuranchie (2013) regard attitude as an individual's way of thinking, acting and behaving, having very serious implications for the learner, the teacher, the immediate social group with which the individual learner relates, and the entire school system. It is a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation or an attitude object.

Like in many other academic subjects, attitude of learners is an important ingredient for effective learning of mathematics. According to Mensah, Okyere and Kuranchie (2013), the indispensable role of attitude in the learning of mathematics has garnered the attention of educational researchers and Mathematics educators for a very long time. This is particularly

supported by Georgina and Yemisi (2014) who have it that attitude plays an important role in the learning of any school subject including Mathematics because it torches the cognitive, affective and behavioural tendencies of the learner. Thus, the way an individual thinks, perceives, feels, values and acts toward mathematics will definitely influence his or her achievement. According to Sen, Yilmaz and Temel (2016), attitude has three dimensions namely cognitive, affective and behavioural. These dimensions occupy an important place in science education. They further argue that attitudes are an important learning output beside academic achievement. They conclude that students' development of positive attitudes towards science courses is one of fundamental objectives for effective learning.

According to Victor (2013, p. 18), "an individual's attitude is an important variable in the learning process. The degree to which a person in the work place effectively applies knowledge and skills obtained through formal training is largely dependent upon the subjects' attitudes toward training." It has also been realised that many students have developed negative attitude towards the study of Mathematics as a result of mass failure of students of the subject (Mensah, Okyere and Kuranchie, 2013). Therefore, we conclude that attitude is an important ingredient for effective learning to take place.

2. Research Methodology

This section outlines research design, population and sampling procedure, validity of research instruments and data analysis procedures.

2.1 Research Design

The study employed case study research design. According to Mugenda and Mugenda (2003, p. 173), case study is "an in-depth investigation of an individual, group, institution or phenomena." Koul (2001) further maintains that researchers in case studies attempt to examine an individual or unit in depth in order to gather pertinent information about the present status and experiences. Since performance in mathematics is a problem in Tanzania, the researchers picked Arusha City as a case study.

2.2 Population and Sampling Procedures

The study was conducted in Arusha City which has a total of 20 Public Secondary Schools. The researchers randomly selected 8 out of 20 schools which is 40% as sample. In each school, researchers sampled one stream of Form Three students as representatives. A total of 412 students participated in the study by filling the questionnaire.

2.3 Validity and Reliability

Before actual data collection, expert judgment was used to ensure that the questionnaire items provide useful information that responds to research questions. Three experienced researchers looked at the content and format of the items, reading over the items in the instruments and commented on each item that they felt does not measure the objectives of the study before the actual data collection.

Table 1: Reliability Test Results

SN	Variable	Cronbach's Alpha	Interpretation
1	Attitude toward Mathematics	0.789	Reliable
2	Use of Humour in Teaching	0.780	Reliable
3	Mathematics Achievement	0.730	Reliable

Each subsection of questionnaire items was tested through SPSS program to ensure acceptable reliability. The cut off point for acceptable reliability was 0.6 Cronbach's Alpha. Statistical Package for Social Sciences (SPSS) provided the following results in terms of cronbach's alpha in different variables to indicate that the questionnaire instrument was reliable and authentic:

2.4 Data Analysis Procedures

Quantitative method in terms of descriptive statistics established frequencies and percentages of closed-ended responses while inferential statistics in terms of t-test and Pearson Product moment corelational coefficient tested differences and relationships respectively.

3. Data Presentation and Analysis

Analysis and presentation of data was guided by four research questions. Analysis employed both descriptive and inferential statistics. Mean scores of various items was interpreted as follows: 3.50-4.00 = Strongly Agree, 2.50-3.49= Agree, 1.50-2.49 = Disagree and 1.00-1.49 = Strongly Disagree.

3.1 To what extent do students perceive their teachers to use various aspects of humour as instructional strategy in mathematics?

The teachers' use of humour as instructional tool was rated by students in seven statements through mean scores.

Table 2: The Use of Humour in Teaching and Learning Process

SN	Item	Mean	STD. Dev	Interpretation
1.	My mathematics teacher criticizes students in a friendly manner.	3.0634	.98937	Agree
2.	Strategies used by my mathematics teacher reduce tension.	2.9976	1.03003	Agree
3.	My mathematics teacher gives short stories that lead to laughter.	2.6359	1.06411	Agree
4.	My mathematics teacher does funny things that lead students to smile.	2.4732	1.04449	Disagree
5.	Sometimes my mathematics teacher laughs while teaching.	2.37864	1.106200	Disagree
6.	My mathematics teacher tells interesting stories about himself/ others.	2.3537	1.12291	Disagree
7.	My mathematics teacher is	2.2910	1.07144	Disagree

	comfortable when students laugh at him/ her.

Respondents agreed with the first three statements in Table 2 and disagreed with the rest of statements. Particularly, respondents agreed that mathematics teachers criticises students in a friendly manner (M=3.0634, SD=.98937), strategies used by mathematics teachers reduce tension (M=2.9976, SD 1.03003) and that mathematics teachers give stories that lead to laughter. It is worth noting the use of humour in these three statements because the use of humour in teaching and learning process makes the lesson to be interesting and learners to enjoy it and consequently perform better. This is supported by Al-Duleimi and Aziz (2016, p. 105) who argue that "humour is beneficial in the classroom because it increases social bonding between teachers and students, salience of information, and ultimately recall and retention." Further, results of Makewa, Role and Genga (2011) indicate that teachers who use humour in teaching are rated effective by the learners in terms of motivation, creation of engaging lessons and anxiety reduction. The teachers are also rated effective in terms of stimulation of thought and interest in students and fostering of a positive teacher-student relationship.

Respondents, however, disagreed that their mathematics teachers do funny things that lead students to be happy (M=2.4732, SD=1.04449) and that sometimes their mathematics teachers laughs while teaching (M=2.37864, SD=1.106200). Furthermore, students disagreed that mathematics teachers tell interesting stories about themselves (M=2.3537, SD=1.12291) and that the teachers are comfortable when students laugh at them. This implies that mathematics teachers are very serious when teaching and do not create a sense of friendship with the learners, something which can lead learners to hate the subject matter and therefore perform poorly. According to Abdi Ali, Ashur, Ghazi and Muslim (2016), if students like their teachers, they will start liking the subjects taught by them and be more attentive in the class. They also quote Vijay, et al, 2014, p. 260-61) who have it that "A strict teacher can be successful but a humorous teacher can be more successful."

3.2 What is the attitude of secondary school students in Arusha City toward Mathematics?

This research question called for establishment of learners' attitude toward mathematic. With this regard, students were needed to respond to seven items as reflected in Table 3. It is worth noting that students' responses to all seven items ranged between 2.50 and 3.49 meaning agreement.

Table 3: Students Attitude toward Mathematics

SN	Item	Mean	STD. Dev	Interpretation
1.	Mathematics is necessary for human activities.	3.3107	.84611	Agree
2.	Mathematics is a key subject in Secondary School Curriculum.	3.2019	.94254	Agree
3.	Mathematics is a powerful tool and gate keeper for success in life.	3.1703	.93454	Agree
4.	Mathematics is interesting subject.	3.1119	.90372	Agree

5.	Mathematics should be compulsory for every student.	3.0560	1.00694	Agree
6.	Mathematics is important for existence of any individual in the society.	3.0316	.92207	Agree
7.	Mathematics is my favourite subject.	2.9075	.93507	Agree
8.	If mathematics is made optional, I will choose it	2.8854	1.12714	Agree

This implies that students under investigation had positive attitude toward mathematics. According to Georgina and Yemisi (2014), attitude plays an important role in the learning of any school subject including mathematics. It torches the cognitive, affective and behavioural tendencies of the learner. Thus, the way an individual thinks, perceives, feels, values and acts toward Mathematics will definitely influence his or her achievement in Mathematics.

Particularly, students agreed that mathematics is necessary for human activity (M=3.3107, SD=.84611), mathematics is a key subject in secondary school curriculum and that mathematics is a powerful tool and gate keeper for success in life. This is in harmony with Adegun and Adegun (2013) who contend that mathematics is a powerful tool and gate keeper for success in life. Kemboi, Githua and Changeiywo (2014, p. 56) further argue that "knowledge of mathematics as a tool for use in everyday life is important for the existence of any individual and society."

Furthermore, respondents agreed that mathematics is interesting subject (M=3.1119, SD=.90372). This is something good because interest in learning is a key for success in learning. They also agreed that mathematics should be compulsory for every student (M=3.0560, SD=1.00694), it is important for existence of any individual in the society (M=3.0316, SD=.92207), it is their favourite subject (M=2.9075, SD=.93507) and that if mathematics is made optional, they will choose it. These findings show the confidence students have in mathematics which means that it is easy to convince them to take the subject regardless of prevailing poor performance in the subject.

3.3 What is the perceived level of students' achievement in Mathematics?

This research question was intended to measure how students feel to have achieved in mathematics.

Table 4: Learners' Achievement in Mathematics

SN	Item	Mean	STD. Dev	Interpretation
1.	My mathematics ability increases from day to day.	3.0854	.91177	Agree
2.	Mathematics knowledge helps me to perform well in other subjects.	3.0243	.95733	Agree
3.	My performance in mathematics meets my expectations.	2.5872	.95805	Agree
4.	I perform well in mathematics.	2.4915	.97620	Disagree
5.	My mathematics ability is better	2.4793	.97602	Disagree

	than that of students from other schools.			
6.	My performance in mathematics is better as compared to other subjects.	2.1927	.94569	Disagree

In response to this question, students were needed to respond to six items in the questionnaire. As Table 4 indicates, students agreed that their mathematics ability increases from day to day (M=3.0854, SD=.91177) and that mathematics knowledge helps them to perform well in other subjects. This implies that mathematics knowledge cuts across other academic subjects and can be used as a tool for better performance in other subjects. Also respondents agreed that their performance in mathematics meets their expectations (M=2.5872, SD=.95805).

However, respondents disagreed that they perform well in mathematics (M=2.4915, SD=.97620), their mathematics ability is better that that of students from other schools (M=2.4793, SD=.97602) and that their performance in mathematics is better as compared to other subjects (M=2.1927, SD=.94569). The fact that their performance meets their expectations while at the same time they do not perform well in mathematics and their performance is worse than in other subjects suggests that their expectation in mathematics is limited to their level of performance. When their performance is raised, they can expect to perform much better in the subject.

3.4 Is there significant relationship between the use of humour in Mathematics teaching and the following variables: students' attitude toward mathematics and students' achievement in mathematics?

This was a key research question in this paper trying to establish the influence of humour as an instructional strategy in students' attitudes and mathematics achievement. As reflected in Table 5, there is a weak correlation between the use of humour in teaching and learning process (r=.100, Sig. (2-tailed)= 0.42) and learners' attitude toward mathematics. Since this correlation is positive, it implies that the more the use of humour in mathematics teaching, the better the attitude of learners toward mathematics. Therefore, humour can be used as an instructional strategy to increase learners' positive attitude towards mathematics.

Table 5: Correlations between humour, students' attitude and mathematics achievement.

Correlations

		Learners' Attitude toward Mathematics	Use of Humour in Teaching	Learners' Mathematics Achievement
Learners' Attitude toward Mathematics	Pearson Correlation	1	.100*	.501**
	Sig. (2-tailed)		.042	.000
	N	412	412	411
Use of Humour in Teaching	Pearson Correlation	.100*	1	.196**
	Sig. (2-tailed)	.042		.000
	N	412	412	411

Learners' Mathematics Achievement	Pearson Correlation	.501**	.196**	1
	Sig. (2-tailed)	.000	.000	
	N	411	411	411

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Secondly, there is a significant moderate relationship (r=.501, Sig. (2tailed) = 0.00) between learners' attitude toward mathematics and learners' mathematics achievement. Since this correlation is positive, it implies that as one variable increases, the other variable also increases. This means that the more the positive attitude towards mathematics, the better the mathematics achievement. Therefore, enhancement of learners' positive attitude toward mathematics can increase learners' achievement level in mathematics subject.

4. Conclusions and Recommendations

Based on findings in this study with regard to the influence of humour on learners' attitude and mathematics achievement, it can be concluded that mathematics teachers criticise learners in a friendly manner, strategies used in teaching reduce tension and mathematics teachers give stories that lead to laughter. Mathematics teachers, however, are very serious when teaching and do not create a sense of friendship with learners, something which can lead learners to hate the subject matter and therefore perform poorly.

Students had positive attitude toward mathematics. Particularly, they agreed that mathematics is necessary for human activity, it is a key subject in secondary school curriculum and it is a powerful tool for success in life. They also agreed that mathematics should be compulsory for every student, it is important for existence of any individual in the society, it is their favourite subject and if it is made optional, they will choose it.

The more the use of humour in mathematics teaching, the better the attitude of learners toward mathematics. Therefore, humour is an effective strategy to increase learners' positive attitude towards mathematics. The more the positive attitude towards mathematics, the better the mathematics achievement. Therefore, enhancement of learners' positive attitude toward mathematics can increase learners' achievement level in mathematics subject.

Based on conclusions of this study, it is recommended that Mathematics teachers should increase the use of humour while teaching in order to increase learner's interest in the subject matter and in that way improve performance. Furthermore, Mathematics teachers need to strive to inculcate positive attitude toward mathematics in order to increase achievement in the teaching-learning process.

Reference

AbdiAli, A, Ashur, N., Ghazi, L. and Muslim, A. (2016). Measuring Students' Attitudes towards Teachers' Use of Humour during Lessons: A Questionnaire Study. *Journal of Education and Practice 7*(35), 52-59.

Adegun, I. K. and Adegun, B. O. (2013). Students and Teachers' Views of Difficult Areas in Mathematics Syllabus: Basic Requirement for Science and Engineering Education. *Journal of Education and Practice 4*(12), 235-243.

Al-Duleimi, A. D. D. and Aziz, R. N. (2016). Humour as EFL Learning- Teaching Strategy. *Journal of Education and Practice 7*(10), 105-115.

Fact Sheet, Education in Tanzania Retrieved March 1, 2017) from http://www.stmarys.ac.uk/shocc/docs/Tanzania-Education-Fact-Sheet-Apr11.pdf

Farrant, J.S (1999). *Principles and practice of education*. Singapore: Longman Group.

Gitaari, E. M., Nyaga, G., Muthaa, G., and Reche , G. (2013). Factors Contributing to Students Poor Performance in Mathematics in Public Secondary Schools in Tharaka South District, Kenya. *Journal of Education and Practice 4*(7), 93-99.

Hamilton, M., Mahera, W. C., Mateng'e, F. J., and Machumu, M. M. The Economic and Social Research Foundation (Retrieved March 1, 2017) from www.esrftz.org

Kemboi, N., Githua, B and Changeiywo, J (2014). The Relationship between Students' Attitude towards Mathematics and their Mathematics Self-Concept and Achievement in the Military Science Programme of Egerton University. Kenya. *Journal of Education and Practice 5*(39), 56-63.

Kiplagat, P., Role, E., and Makewa, L. N. (2012). Teacher commitment and mathematics performance in primary schools: A meeting point! *International Journal of Development and Sustainability 1*(2), 286-304.

Koul, L. (1997). *Methodology of educational research* (3rd ed.). New Delhi: Vikas Publishing House.

Mabula, S. (2015). Modeling Student Performance in Mathematics Using Binary Logistic Regression at Selected Secondary Schools A Case Study of Mtwara Municipality and Ilemela District. *Journal of Education and Practice 6*(36), 96-103.

Makewa, L. N., Role, E., and Genga, J. A. (2011). Teachers' Use of Humour in Teaching and Students' Rating of Their Effectiveness. *International Journal of Education 3*(2), 1-17.

Mbugua, Z. K., Kibet, K., Muthaa, G. M., and Nkoke, G. R. (2012). Factors Contributing To Students' Poor Performance in Mathematics at Kenya Certificate of Secondary Education in Kenya: A Case of Baringo County, Kenya. *American International Journal of Contemporary Research 2* (6), 87-91.

Mensah, J. K., Okyere M. and Kuranchie, A (2013). Student attitude towards Mathematics and performance: Does the teacher attitude matter? *Journal of Education and Practice 4*(3), 132-139.

Mugenda, O. M. & Mugenda, A. G. (2003). *Research methods: Quantitative and qualitative approaches.* Nairobi: ACTS Press.

Mefun, F. E. (2014). Mathematics Teachers' Assessment of the Role of Millennium Development Goals in the Implementation of the 9-Year Basic Education Mathematics Curriculum. *Journal of Education and Practice 5*(36), 152-157.

Ministry of Education and Vocational Training (2007).*Curriculum for ordinary level secondary education in Tanzania (*2013 ed,). Dar es Salaam: Tanzania Institute of Education.

Olubunmi, O. A., Akinsete, A. and Omoniyi, M. (2013. Attitude of Teachers and School Variables in Secondary Schools in Ondo State, Nigeria. *Journal of Education and Practice 4*(28), 38-42.

Ramadhan, H. M. (2012*). Poor Performance of Mathematics in Tanzania Secondary Schools: A Case Study of Mtwara-Mikindani, Tanzania.* Lap Lambert Academic Publishing GmbH KG

Role, E. (2015).*Integrating Christian values and learning in the teaching of mathematics in Institute for Christian Teaching. Retrieved from Education Department of Seventh-day Adventist.* http://www.researchgate.net/publication/239928141

Saun, J. S. (2014). Factors affecting underachievement in mathematics. Proceeding of the Global Summit on Education GSE 2014 (E- ISBN 978-967-11768-5-6) 4-5 March 2014, Kuala Lumpur, MALAYSIA. Organized by WorldConferences.net

Sen, S., Yilmaz, A. and Temel, S. (2016). Adaptation of the Attitude toward the Subject of Chemistry Inventory (ASCI) into Turkish. *Journal of Education and Training Studies 4*(8), 27-33.

Uffor, D. I. (2017). Teachers' Attitude towards Special Need Students in Secondary Schools in North Senatorial District of Edo State, Nigeria. *Journal of Education and Practice 8*(4), 6-12.

Victor, S. (2013). Teacher-trainees attitude toward ICT. *Journal of Education and Practice 4*(19), 18-22.

APPENDICES

CSEE Performance of in Arusha City (2016)

SN	SCHOOL NAME	SAT	PASS (N)	PASS (%)
1	School1	225	96	42.7
2	School 2	376	84	22.3
3	School 3	77	17	22.1
4	School 4	346	76	21.9
5	School 5	396	58	14.6
6	School 6	228	33	14.5
7	School 7	194	25	12.9
8	School 8	301	37	12.3

9	School 9	154	19	12.3
10	School 10	177	21	11.9
11	School 11	265	28	10.6
12	School 12	188	18	9.6
13	School 13	147	22	8.9
14	School 14	361	30	8.3
15	School 15	330	27	8.2
16	School 16	267	13	4.5
17	School 17	221	10	4.5
18	School 18	113	5	4.4
19	School 19	87	3	3.4
20	School 20	97	2	2.1
TOTAL		**4550**	**624**	**13.7**

Source: National Examination Council of Tanzania Results, 2016 (http://www.necta.go.tz/)