

RELATIONSHIP BETWEEN SECONDARY SCHOOL STUDENTS' PERCEPTION OF TEACHERS' ATTITUDE TOWARDS TEACHING AND PERFORMANCE IN MATHEMATICS IN BWARI, F.C.T, ABUJA.

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Abstract

This study was carried out to investigate the relationship between students' perception of teachers' attitude to teaching and students' performance in Mathematics. The study adopted a Correlational research design on a sample of 340 Senior Secondary School Two (SSS2) students randomly drawn from a population of 2736 SSS2 students in F.C.T, Abuja. Four research questions and three hypotheses were formulated to guide the study. A self- design questionnaire was used as instrument for data collection. The questionnaire was validated by test and measurement experts. The reliability of the instrument determined by Cronbach's alpha (α) coefficient was 0.81, indicating the instrument was reliable for data collection. Mean and Standard Deviation scores were used to answer the research questions. The formulated hypotheses were answered using Pearson Product Moment Correlation Coefficient and Point Biserial Correlation. Findings from the study revealed students' perception of their teachers' attitude to teaching of Mathematics was positive and a positive significant relationship was found between students' perception of teachers' attitude to teaching and students' performance in Mathematics. However, on the relationship between gender and students' perception of teachers' attitude to teaching, no significant relationship was established. Based on these findings, it was recommended that students should participate actively in the evaluation process since their perceptions about their teachers' attitude to work will help teachers assess their effectiveness regularly, adjust their methodology and enhance their productivity. Knowing students' perception of their teachers' attitude to teaching will also help the teachers to ascertain the importance of building and maintaining healthy relationship with the students, which will enable the teachers create a conducive environment where

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learning Mathematics can become fun for students.

Keywords: *Students' perception, Teachers' attitude, Performance, Mathematics*

Introduction

Academic transition is the desire of all and sundry. It is the joy of all stakeholders to see students transit successfully from one educational level to another. Usually, student's academic progress is measure by performance in internal and external examinations, and their performance at the lower level guarantees their promotion and proper placement at the higher level. However, academic transition at any phase is generally challenging for students, from the primary school level to the secondary school level, especially in a subject like Mathematics that is often considered by students' as abstract in nature.

Nevertheless, Mathematics education remains the key to a brighter future, and an effective teacher with good attitude can play a vital role in helping students transit well with little or no problem during this period. Often, effective teachers position themselves in such a way to directly or indirectly cushion the painful experience that comes with this transition period. They motivate, coordinate, encourage, instruct, counsel and do more to help students in achieving their goals, directly or indirectly. And this in turn help students transit to their next educational level successfully. Therefore, teachers' attitude and physical interaction with the students are instrumental for good performance. Attesting to this fact, Banerjee and Behera (2014) opine a significant relationship exists between teachers' attitude to work and students' academic performance. Catherine (2015) and Rubie-davies, (2012) also agreed teachers' poor attitude has adverse effect on students' performance. Ajai and Iyekekpolo (2016), corroborated the fact that most teachers are not ready to help students learn base on their individual differences. Without doubt, a cordial relationship between teachers and students is paramount during this period of transition to ensure good performance at any level of education. A positive teacher-student relationship can serve as a cushion to help transiting students achieve success and the effects of this relationship on students' academic performance can be remarkable. The stronger the intimacy between the two parties, the better the engagement of students in academic activities (Anyagh, Hanmane & Abah, 2018).

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While, a negative or poor teacher-student relationship will hamper students' performance. Hence, the need to build a positive relationship between the teacher and student to ensure smooth transition of students from one educational level to the other is necessitated. Akiri (2013) opines teachers' instructional effectiveness is not the only determinant of academic performance, the teachers must also have positive influence on students' academic performances through their behavior in and outside the classroom. Also, VanUden (2014) attest to the fact that students' positive engagement in academic activities are predicted by teacher beliefs and attitude. And that the role of teachers' attitude in fostering student performance as they transit from one educational level to another are related to the three dimension of student engagement—behavioral, emotional, and cognitive. Also, Anyaghet *al.* (2018) is of the opinion that there is a strong correlation between teachers' attitude to work and students' performance. Thus, an effective teacher must of necessity maintain a positive attitude in the classroom to enable him or her sustain a conducive environment that will enable students' successfully transit from one level to another level with remarkable performances: since teachers' personality traits are said to be more powerful and influential than the instructional strategies they use in the classroom (Ekperi, Ude & Nyejiri, 2019). Consequently, students' perception of their teacher's attitude definitely has an unimaginable influence on students' attitude towards the subject; especially at the elementary and secondary levels of education where teachers are taken as models by their students. Their opinion about their teachers' attitude in the classroom is vital. This places the teachers at the center of focus at all time. With this mindset, both the verbal and non - verbal communication displayed by the teachers is taken hook, line and sinker. In other words, teacher's attitude to a subject is a barometer for student's choice of attitude towards the same subject. This scenario could be mild when dealing with subjects naturally considered simple by the students. But when it is Mathematics, the impact of the influence of the student's perception of the teacher's attitude towards the subject is very great on student's performance due to its abstractness. Students must therefore see their teachers as friends not enemies, facilitators not tormentors, motivators and not deceivers. Their information regarding their teachers' attitude to word may provide a more meaningful insight into what their teachers do in the

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classroom. Students' perception about their teachers' attitude towards their job is often based on their experiences in the classroom. Also, their perception about their teachers' attitude to teaching can providevaluable suggestions and properevaluation of teachers' effectiveness and performance(Ahmed& Aziz, 2009, Collins, 2011; Yang, 2013).

Also, on gender difference in students' perception of teachers' attitude to teaching and their performance, Kim, Fisher and Fraser (2010) ascertained there is Gender-related differences in students' perception of teacher behaviour, while Anyaghet *al.* (2018) is of the opinion that there is on significant difference in students' perception of their teachers' attitude based on gender and this has no major influence students' performance. This is simply based on the fact that both (boys and girls) are exposed to equal experiences in the class by the same teacher. Moreso, little empirical studies supported the view that students' perceptions of their teachers' attitude to work is fundamentally consequential (Sidhu, 2009).

Statement of Problem

Repeatedly, students' poor performance in Mathematics has been attributed to teachers' poor attitude and ineffectiveness in the classroom (Ekperiet *al.*, 2019) without recourse to students' poor perception of their teachers' attitude. Although, some commendable research works have examined the relationship between teachers' attitude, teachers' perception of students' academic abilities and students' actual academic performance (Asikhia, 2010; Rubie-davies, 2012 and Evans 2013); all of these nevertheless are not exhaustive. Evans (2013) attributed teachers' negative attitude to student's poor performance in his work. And Anyaghet *al.* (2018) is of the opined that there is on significant difference in students' perception of their teachers' attitude based on gender. However, these and other research works noticed, focused mainly on students' reading abilities, teachers' attitude and teachers' perception of students as factors responsible for students' poor performance in Mathematics. None directly pointed out whether there is or there is no relationship between students' perception of teachers' attitude towards teaching and students' performance in Mathematics.

Apparently, there could be a link between students' perception of their teachers' attitude towards teaching and students' performance in Mathematics. This link could be adjudged by a lay man to be poor, good or excellent. Therefore, this study

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is set out to investigate if there is a relationship between secondary school students' perception of teachers' attitude towards teaching and their performance in Mathematics.

Research Questions

The study was guided by the following research questions

1. What is the perception of students about their teachers' attitude to teaching of mathematics?
2. What is the mean difference of students' perception of teachers' attitudes to teaching Mathematics based on gender?

Null Hypotheses

Null hypotheses were formulated for this study and tested at 0.05 level of the confidence

H0₁: There is no significant relationship between students' perception of teachers' attitude towards teaching and their performance in Mathematics.

H0₂: There is no significant relationship between students' gender and their perception of teachers' attitude to teaching of Mathematics

Methodology

A correlational design was adopted for this study. According to Donald *et al* (2010), in Correlational research design, the researcher seeks to access relationship between variables. The study was conducted in Bwari, F.C.T Abuja. The population of the study was 2736 Senior Secondary School Two (SS 2) students from five Government Senior Secondary Schools in the study area. From this, 340 (170 male and 170 female) students were sampled using Krejcie and Morgan. The choice of senior secondary school two was purposive. This was basically due to the fact that they were in their second year in senior secondary school and had acquainted themselves to the school environment. They have studied Mathematics as a school subject long enough to provide judgment about their teachers' attitudes teaching. Also, their cumulative termly results can be easily accessed and collected for the research purpose from the schools' exam officers. For the study, the instrument for data collection was a structured questionnaire developed by the researcher on students' perception of their

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teachers' attitudes toward teaching. The questionnaire was divided into two sections of A and B. Section A contained items on demographic information such as, name of schools, sex and class. Section B contained 10 items on students' perception about teachers' attitude to teaching with each statement on a Five (5) points Likert rating scales of SD (Strongly Disagree) 1 point, D (Disagree) 2 points, N (Neutral) 3 points, A (Agree) 4 points and SA (Strongly Agree) 5 points. While negative items were scored in the reverse order of SD (Strongly Disagree) 5 points, D (Disagree) 4 points, N (Neutral) 3 points, A (Agree) 2 points and SA (Strongly Agree) 1 point. Responses gathered were used to calculate a mean rate score for everyone (student). The maximum mean range score for an individual (student) will be 5 and the minimum will be 1. The mean score reflects the students' perception invariably. High mean score was associated with positive or good perception (equal or greater than 3) and low mean scores (less than 3) with negative perception. The questionnaire was validated by test and measurement experts. The reliability of the instrument determined by Cronbach's alpha (α) coefficient was 0.81, indicating the instrument was reliable for data collection. Responses on students' perception about their teachers' attitude were converted to percentages in order to correlates them with their performance in Mathematics. Research questions were analyzed using mean, standard deviation and Pearson Moment Correlation coefficient was used to test null hypothesis one, while hypothesis two was tested using Point-Biserial correlation (Point-Biserial correlation correlate between normal and interval data) at 0.05 level of significant.

Results: The results are presented according to the research questions and hypotheses.

Research question one: What is the perception of students about their teachers' attitude to teaching of mathematics?

Table 1: Students' perception of teachers' attitude to teaching Mathematics

S/N	Items	N	Mean (\bar{X})	S.D	Decision
1	My Mathematics teacher comes to class regularly for his/ her lesson.	340	4.39	.97	Positive
2	My Mathematics teacher always admits his/ her mistakes, pointed out by students willingly.	340	4.25	1.07	Positive
3	My Mathematics teacher usually treats	340	4.02	1.25	Positive

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	us equally.					
4	My Mathematics teacher usually entertain question from students.	340	3.89	1.35	Positive	
5	My Mathematics teacher usually leaves the class before the end of the period	340	3.34	1.57	Positive	
6	My Mathematics teacher spares no body that deserves punishment.	340	3.59	1.42	Positive	
7	My Mathematics teacher easily get provoked by our responses while teaching	340	3.19	1.56	Positive	
8	My Mathematics teacher makes phone calls regularly in class	340	3.29	1.62	Positive	
9	My Mathematics teacher is always pleased with our individual achievement in Mathematics	340	3.75	1.41	Positive	
10	My Mathematics teacher sells personal goods in the classroom, during his period	340	3.30	1.76	Positive	
	Grand (Mean & Standard Deviation)	340	3.70	1.40	Positive	

Decision Mean =3.00

Table 1: shows the Mean and Standard Deviation of students' perception of teachers' attitude to teaching Mathematics. The table reveals the mean of items 1-10 is between 3.30 and 4.40, and their grand mean to be 3.70. The grand mean of 3.70, in this case, is above the decision mean of 3.00, a clear indication that students perceived their teachers as having positive attitudes towards teaching Mathematics. The standard deviation grand mean is 1.40, indicating that there is no meaningful deviation of respondents' perception from each other.

Research Question two: What is the mean difference of students' perception of teachers' attitudes to teaching Mathematics based on gender?

Table 2: Mean and Standard Deviation of responses on students' perception of teachers' attitude towards teaching based on gender

	Gender	N	Mean (\bar{X})	Standard Deviation (S.D)
Total	Male	170	72.89	6.45
	Female	170	75.05	8.53

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Table 2: shows the mean and standard deviation of male and female students' perception of their teachers' attitudes in teaching Mathematics scores. The result revealed the mean and standard deviation of the male students as $\bar{X} = 72.89$ with $SD = 6.45$ and the female students as $\bar{X} = 75.05$ with $SD = 8.53$ respectively. This finding could be based on the fact that both (male and female students) are subject to the same experiences in the classroom. The finding is highlighted using a scattered plot.

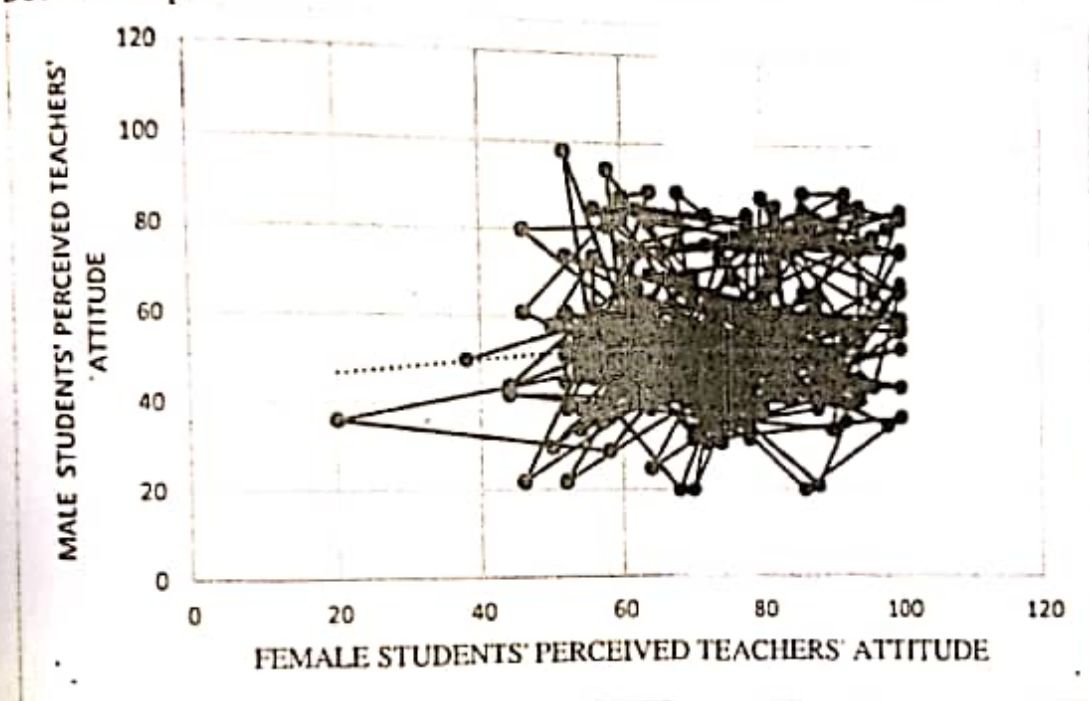


Figure 1

Figure 1: is a scattered plot of the responses of the respondents on students' perception of teachers' attitude towards teaching based on gender difference. The scattered plot indicates that there seem to be a relationship between the two constructs. Therefore, Pearson Product Moment Correlation Coefficient will be used to determine the magnitude and direction of the relationship

Hypothesis one (H_{01}): There is no significant relationship between students' perception of teachers' attitude to teaching and students' performance in Mathematics

Table 3: Summary of Pearson Moment Correlation Between students' perception

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of teachers' attitude and students' performance					
Variables	N	Mean (\bar{X})	Standard Deviation (S.D)	r-cal	P-value
Perceived teachers' attitude	340	55.64	15.54	0.144	.008
Students' performance	340	73.97	13.55		

Table 3: above shows the correlation between students' perception of teachers' attitude to teaching Mathematics and students' performance in Mathematics. The table revealed that students' perception of teachers' attitude to teaching Mathematics had a Mean score of ($\bar{X} = 55.64$ and S.D =15.54), students' performance in Mathematics had Mean score of ($\bar{X} = 73.97$ and SD=13.55), while the r-cal. = 0.144 indicating there was a weak positive significant relationship between students' perception of teachers' attitude to teaching Mathematics and their performance in Mathematics at $p = 0.05$.

Hypothesis two (H_{02}): There is no significant relationship between students' gender and their perception of teachers' attitude to teaching of Mathematics. The relationship between students' gender and their perception of teachers' attitude to teaching of Mathematics was determined using Point Biserial Correlation and the result is as presented in Table 4

Table 4: Relationship between Gender and Perceived Teachers' Attitude to Teaching

		Perceived Teachers Gender Attitudes	
Gender	r_{pb} Correlation	1	.080
	Sig. (2-tailed)		.143
	N	340	340
Perceived Attitude	Teachers' r_{pb} Correlation	.080	1
	Sig. (2-tailed)	.143	
	N	340	340

Table 5 revealed there is no significant relationship between students' gender and perceived teachers' attitude in teaching of Mathematics. The results show

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$r_{pb} = 0.08$, $p\text{-value} = 0.14$, which means $p > 0.05$, the null hypothesis two is accepted. The correlation coefficient ($r_{pb} = 0.08$) further shows that there is a weak positive relationship between gender and Perceived teachers' attitude to teaching. Hence, gender has no significant influence on Perceived teachers' attitude to teaching

Discussion of Findings

The results of this study shows that students' perception of teachers' attitude towards teaching is positive. The finding of the study is in contrast with that of Anyagh et al (2018) and Yang (2013) with the submission that students perceived their teachers' attitude as negative towards them. While, in support of this finding, Rawnsley (2010) opines students develop positive attitude toward their Mathematics lessons when their perception about their teachers' attitude is positive.

The findings of this study also revealed there is a significant relationship between students' perception of their teachers' attitude to teaching and their performance. This finding is in agreement with the following researchers works: (Benerjee and Behera, 2014, Idowu, 2015 and Ekperi et al., 2019) whose studies pointed out there is a significant relationship between students' perception of their teachers' characteristics and attitude towards the teaching of Mathematics and students' performance. The result of the study is also in line with the work of Saroyan *et al* (2009) whose study revealed, students' perception of their teachers' attitude is dependent on the fact that they have been taught by the teachers in question and they are familiar with them, and this influences their performance.

The finding of this study also revealed that there is no significant relationship between students' gender and their perception of teachers' attitude in teaching. This finding is in agreement with Rajoo (2013) whose study attested to the fact that there is no significant difference between students' perception based on gender. This attest to the fact that students' perception of their teachers' attitude to teaching is a function of orientation rather than gender. While, Anyaghet *al*, 2018 and Owiti's (2011) are also of the opinion that students' gender difference and their attitudes towards their teachers correlates but has no significant difference. Therefore, by implication, students' perception of their teachers'

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attitude to teaching is highly influenced by the attitude of the teacher in and out of the classroom, since the teaching and learning experiences are mainly coordinated by teachers (Ampadu, 2012).

Conclusion

Findings of this study revealed student's perception of teacher's attitude to teaching definitely has an unimaginable influence on the students' attitude towards the subject; especially at the elementary and secondary levels of education. The study also affirms students' perception of their teachers' attitude to teaching is a function of orientation rather than gender. Therefore, the active participation of students in any teaching and learning process is paramount, and their perceptions about their teachers can help teacher to access and adjust their poor attitude to enhance better performance. Furthermore, knowing students' perception of their teachers' attitude to teaching will also help the teachers to ascertain the importance of building and maintaining healthy relationship with the students, which will enable the teachers create a conducive environment where learning Mathematics can become fun for students.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Teachers should conduct regular evaluation of their teaching practices by asking their students to rate and evaluate their practices.
2. School administrators should help organize seminars, workshops and conferences to help the teachers develop good attitude to their job to enhance their effectiveness in teaching.
3. Government should adopt motivational approaches like, provision of needed instructional materials and robust welfare packages to help adjust teachers' attitude to teaching

References

- Akiri, K. (2013). In-Service Training Needs of Basic Technology Teachers in Enugu State. An Unpublished M. Ed. Thesis. University of Nigeria Nuskka. Nuskka.
- Anyagh, P. I., Hanmane, O. & Abah, J. A. (2018). Secondary School Students'

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The Academic Conference Proceedings of Mediterranean Research and Publications International on the Sub-Sahara growth in the Millenium Era, Vol. 19 No. 1, 29th June, 2021- University of Ilorin, Ilorin, Kwara State, Nigeria.

Perception of Teachers' Attitude towards Learning in Mathematics. *International Journal of Research & Review*, 5(5), 67-75.

- Ahmad, F., and Aziz J. (2009) Students' perception of their teachers' teaching of literature communicating and understanding through the eyes of the audience. *European Journal of Social Science*, 7(3), 17-26
- Ajai, J. T. and Iyekekpolor, S. A. O. (2016). Remedial Students' Perception of Teachers' Attitude Towards Learning in Mathematics in Taraba State University, Jalingo. *Abacus: Journal of Mathematical Association of Nigeria*, 41(1), 256-264.
- Ampadu, E. (2012). Students' perceptions of their teachers' teaching of mathematics: The case of Ghana. *International Online Journal of Educational Sciences*, 4(2), 351-388.
- Banerjee, S.& Behera, S. K. (2014). An Investigation into the Attitude of Secondary School Teachers Towards Teaching Profession, *International Journal of Academic Research in Education and Review*, 2(3), 56-63.
- Catherine, B. (2015). Influence of Teacher Motivational Strategies on Students' Improved Academic Performance In Day Secondary Schools: A case study of Trans Nzoia West District (Master's Thesis). University of Nairobi, Kenya.
- Collins, M., (2011) Reflective faculty evaluation: Enhancing teaching and determining faculty effectiveness. San Francisco: Jossey-Bass
- Fraser, B. J. (2012). Classroom learning environments: Retrospect, context and prospect. In B. J. Fraser, K.G. Tobin, & C. J. McRobbie (Eds.), *Second international handbook of science education* (pp. 1191-1239). New York, NY: Springer
- Ekperi, P. M., Ude, O., & Nyejiri, W. Y. (2019). Teachers' Attitude as a correlate of Students' Academic performance. *International Journal of Research and innovation in Social Science*. 3 (1), 205.
- Idowu, A. A. (2014). Effect of student -teacher ratio on academic achievement of selected secondary school. *Journal of Education and Practice*, 5(24), 12-14.
- Kim, H., Fisher, D. & Fraser, B. (2010). Classroom environment and teacher interpersonal behavior in secondary science classroom in Korea. *Evaluation and Research in Education*, 14, 3-22.
- Owiti, D. S. (2011). Students' sex and attitudes toward mathematics: A case of secondary school students in Eldoret municipality, UasinGishu District, Kenya. *International Journal of Educational Research and Technology*, 2(2), 56-61.
- Pietrzak, D., Duncan, K., & Korcuska, J. S. (2008). Counseling students' decision-making regarding teaching effectiveness: A conjoint analysis. *Counselor Education & Supervision*, 48, 114-132.

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The Academic Conference Proceedings of Mediterranean Research and Publications
International on the Sub-Sahara growth in the Millenium Era, Vol. 19 No. 1, 29th June,
2021- University of Ilorin, Ilorin, Kwara State, Nigeria.

- Saroyan, A., Dangenais, J., & Zhou, Y. (2009). Graduate students' conceptions of university teaching and learning: Formation for change. *Instructional Science: An International Journal of the Learning Sciences*, 37, 579-600
- Shadrek, M. (2012). Zimbabwe science students' perception of their classroom learning environment and their attitude towards science. *Mediterranean Journal of Social Science*, 3(11), 415-425.
- Sidhu, E.F. (2009). The relation between stressful life events and adjustment in elementary school children: The role of social support and social problems-solving skills. *Child Development*, 60, 1412-1423.
- Rajoo, M.A. (2013). Students' perception of mathematics classroom environment and mathematics achievement: A study in sipitang, Sabah, Malaysia. *ICSSR E-Journal of Social Science Research*, 2013, 325-343.
- Rawnsley, D.G. (2010). Learning environment in mathematics classroom and their association with students and learning. Paper presented at the Australian Association for research in Education Conference, Adaliade, Australia. Retrieved on 4th March, 2017 from <http://www.aare.edu.au/98pap/fis98269.htm>
- Rubie- Davies, C.M. (2012). Teachers' expectations and perception of students' attributes is there a relationship? *British Journal of Educational Psychology*, 80, 121- 135.
- Van Uden, M. (2014). The teachers' perspective on students' engagement. Unpublished Thesis University of Twente, Enschede. DOI. 10. 3990/1.978-9036536769.
- Yang, X. (2013). Investigation of junior secondary students' perceptions of mathematics classroom learning environment in China. *Eurasia Journal of Mathematics, Science Technology Education*, 2013