

Influence Extrovert Personality Trait on Mathematics Achievement among Secondary School Students in Kenya

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Abstract The present study investigated the influence of extrovert personality trait on Mathematics achievement among secondary school students in Nyakach sub-county, Kenya. The study will be guided by Eysenck's theory of Personality. The study employed the Concurrent triangulation design within the pragmatic of mixed method approach. The target population comprised of 20 Deputy Principals, 900 form three students, 20 Mathematics teachers and 20 H.O.D's – Guidance & Counseling will be obtained. Data was collected through the Eysenck questionnaire, interview schedule, Standardized Mathematics exams for the schools and Mathematics document analysis. A pilot study was conducted to validate as appropriate the research instruments before the actual research commence. Content construct and face validity was ensured by use of research experts, while reliability will be ensured by split half method. Reliability test was above 0.5 implying high rate of reliability. Trustworthiness of qualitative instruments was ensured according to the four criteria. Quantitative data from the questionnaires was analyzed by both descriptive statistics and inferential statistics such a Pearson product correlation coefficient and regression analysis, while qualitative data was analyzed using thematic framework. There was a positive correlation ($n=878$; $r =.353^{**}$; $p <.01$) between Being extrovert and Mathematic scores among students. Its recommended that teachers should purpose to blend this personality with others during group activities.

Keywords Extrovert, Personality trait, Mathematics achievement, Secondary school students

1. Introduction

Academic achievement is a major issue among students, teachers, parents, school administrators, and the community at large. Attempts have been made by researchers to unravel the complexities surrounding academic achievement. Psychologists have put forward a lot of reasons why these disparities in achievement exist. A lot of attention had been paid to external factors such as type of school, teaching methods, school location, instructional materials, teachers experience, and so on West Africa Examination Council (WAEC, 2005). Many spend lots of money in order to secure good schools either for their children or themselves and those who can afford it even invest on education abroad as they believe this will enhance achievement, and which in turn gives an added advantage in terms of securing gainful employment. Opinions vary as to why some students excel academically while others appear to be underachievers. Many psychologists have consistently attempted to identify

the major predictors of individual academic achievement.

Due to the concern at the rate of decline of academic standard, Big Five otherwise known as CAOEL were therefore explored in order to find possible solutions to the problem of underachievement amongst secondary school students. The acronym CAOEL denotes the traits: conscientiousness, agreeableness, openness, extraversion and locus of control to experience. Extrovert, according to Igbojinwaekwu (2009) is any person who seeks excitement in the external environment. Extraversion refers to an individual who is social, aggressive, self-assured, comfortable, energetic, cheerful, dominant, outgoing, active, assertive and talkative in social situations. Extroverts imply an energetic approach to others easily and to engage in more social interactions and material world. Hossein Daezadeh *et al* (2014) stated that a person might have a dash of openness, a lot of conscientiousness, an average amount of extraversion, plenty of agreeableness and almost no neurotism at all.

A high score on Conscientiousness showed a student who was self disciplined, careful, thorough, organized and determined. Low scores on this trait portrayed indiscipline, carelessness, disorganization and indifference. That student who scored highly on this trait was expected to perform excellently well, academically and vice versa.

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Agreeableness described one who was sympathetic, trusting and cooperative. Students with high scores on agreeableness were selfless, flexible and pleasant. Such students worked with others easily with little or no friction. Those scoring low on this trait however found it difficult to get along with others. Daminabo, (2008) noted this to be psychotics, which referred to a person who was skeptical, unsympathetic, uncooperative and rude. Low scores were expected to affect academic achievement negatively.

Research carried out has shown that there are also non intellectual factors which are associated with academic performance (Poropat, 2009). The non-intellective factor which will be discussed includes personality traits. This study will also look at academic performance and how it is measured. An individual's personality can influence how they perform. Personality is an individual's set of characteristics that influence how they behave (Nelson & Quick, 2005). There are four main approaches to personality which are the trait approach, psychodynamic approach, humanistic approach and the integrative approach.

The trait theory states that in order for people to understand why individuals behave in certain ways, one has to break their behaviour patterns into a number of traits (Nelson & Quick, 2005). Many studies carried out showed that academic achievement is strongly correlated with different measures of individual's personality traits (Poropat, 2009) and one will see how its replicated in studies which will be discussed. An informative analysis was provided which analysed the relationship between intelligence, personality and interest (Ackerman and Heggested 1997). In 2009 Poropat was able to show that academic performance is associated with the five-factor personality traits.

In another study Furnham *et al* (2003), personality traits accounted for 1/5th in exam marks. The will to achieve had been linked to Conscientiousness in the big five model. Meta-analysis indicated that conscientiousness was the strongest personality predictor of academic performance for second and third level education. This was even so after controlling for variables such as intelligence (Poropat, 2009). It was linked to sustained effort, goal setting strategies, high concentration on assignments, effective time management and learning. (Digman, 1996) From this it led one to believe that an individual who scored high on conscientiousness took a strategic or deep approach to learning as they possessed similar qualities.

Abdulahi (2007) writes that in Somalia, the problem of secondary school students 'poor performance in mathematics persisted for a long time. Available records show that performance in mathematics among secondary school students in Somalia is as poor as in other countries. The researcher noted that in the school year 1982-1983, out of 270 students (in one school) only 19 of them passed in mathematics based on oral evidence from one of the secondary school teacher. This gave a failure rate of almost 93%. Similarly, the mean score was very low. According to statistics from the examination board of Imam Shafi'i

Foundation, an educational institution in Mogadishu, out of 232 students who sat for the secondary school leaving examination in the school year 2005-2006, 113 students failed. That accounted for 48.7%. The researcher comments that in Somalia a student is considered to be a failure in a subject if he/she scores below 50% in that subject since they employ the summative type of evaluation.

Madeleine (2013) came up with a study focused on determining how other factors as well as personality traits impact on Mathematics achievement. The results indicated that extroversion was the only trait to have a significant relationship with achievement, showing that students who were more extroverted scored higher on the test. Daele *et al.*, (2006) questioned the effect of extroversion on oral fluency, complexity, and accuracy with 25 Dutch-speakers of English learners and French learners in Belgium. Even though a positive correlation was found between extroversion and lexical complexity in English learners ($r = .35, p < .09$) and French learners ($r = .44, p < .03$), no correlation was found between extroversion and other assessment scores. Apeh, Hosea Abalaka *et al* (2015) studied the influence of extroversion-introversion and subject preference in the academic performance of secondary school students. The study found significance of difference between subject preferences between students showing extroverted and introverted traits as well as significant difference between the academic performances of students due to personality type. Rabae'i (2018) determined the influence of personality on academic achievement and performance TVET teaching graduate students. Results indicated that the types of personality extroversion respondents were in high mean. The results also showed that there is a significant correlation between personality type and achievement. Gruber, and Cunningham (2015) created a study which evaluated neuroticism and extraversion, with the goal of examining the positive and negative outcomes associated with these two traits in the sphere of positive psychology. Results suggested extraversion and neuroticism were significantly related to both subjective happiness and hypomania risk, but this effect was dependant on the specific factors of each trait. Tal Samuel & Gilad Ravid (2014) performed a study that contributed to the fact that extroverts are disadvantaged in the classroom. The findings confirmed that extroverts believed, significantly more so than introverts, that outsiders would be interested in what they have to say, illustrating the potential of such task.

Onderi *et al* (2015) also realized that the performance in mathematics in Masaba Sub-County, Kenya has been poor for many years. In 2010 the mean score was 3.2282, while in 2011 it had a mean score of 3.9528 and in 2012 it had a mean of 4.0660 which is far below the maximum mean of 12.00. The purpose of their study was to assess student factors related to academic achievement in mathematics in Masaba South Sub County. The performance in Mathematics at KCSE for the years under review, clearly indicates that a large proportion of students who leave secondary school education cycle at form four in Kenya do not attain the basic

mastery level of the secondary Maths course. Unless this trend is reversed, the prospects of attaining the goal of Kenya Vision 2030 may not be achieved.

Performance in Mathematics based on the above data implies that this subject has been registering a poor trend over the years among students in secondary schools in Nyakach sub-county. These negative deviations ultimately indicate a problem in the subject. Comparisons of the two counties relay a situation whereby the discipline is becoming a wanting trend particularly in Nyakach sub – county. This therefore informed the research on how best this can be enhanced. The researcher therefore investigated how personality type and locus control can influence mathematics achievement among students in Nyakach Sub County. Unless this trend is changed Nyakach as a Sub – county may not be able to produce students who may be admitted into high education level courses such as in Medicine, Engineering and other careers that are directly attached to Maths.

2. Research Methodology

The study employed the Concurrent triangulation design within the pragmatic of mixed method approach. The target population comprised of 20 Deputy Principals, 900 form three students, 20 Mathematics teachers and 20 H.O.D's – Guidance & Counseling will be obtained. Data was collected through an Eysenck questionnaire, interview schedule, Standardized Mathematics exams for the schools and Mathematics document analysis. A pilot study was conducted to validate as appropriate the research instruments before the actual research commence. Content construct and face validity was ensured by use of research experts, while reliability was ensured by split half method. Reliability test was above 0.5 implying high rate of reliability. Trustworthiness of qualitative instruments was ensured according to the four criteria. Quantitative data from the questionnaires was analyzed by both descriptive statistics and inferential statistics such a Pearson product correlation coefficient and regression analysis, while qualitative data was analyzed using thematic framework.

3. Results & Discussions

To establish whether there was any statistical significant influence of *extrovert* and *Mathematic achievement*, the researcher computed a bivariate Pearson's Product-Moment Coefficient of Correlation between the scores of the two variables. The SPSS output Table 1 shows the correlation results.

From Table 1, it is evident that there was a positive correlation ($n=878$; $r = .353^{**}$; $p < .05$) between Being extrovert and Mathematic scores among students, it was statistically significant. Given that the p-value was less than .05, the null hypothesis which stated that "*There is no statistically significant extrovert and Mathematics*

achievement among students in Nyakach Sub County" was rejected. It is therefore concluded that there is statistically significant positive relationship between being extrovert and Mathematic achievements among the students, with more association with people the higher mathematics achievements among the respondents. This finding agrees/disagree with Eysenck's three factor theory of personality which supports the fact that the extroverted pupils supply better answers to questions than their introverted counterparts. The no significance difference in the mean percentage scores between the extroverted and introverted pupils may probably stem from the fact that the extroverted pupils who seem to have interest in what goes on in their environment gain more during the classroom interactions with the teachers.

Table 1. Correlations between extrovert and Mathematic achievement

		Mathematic achievements	Extrovert
Mathematic achievements	Pearson Correlation	1	.353**
	Sig. (2-tailed)		.000
	N	879	878
Extrovert	Pearson Correlation	.353**	1
	Sig. (2-tailed)	.000	
	N	878	886

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

Qualitative results were obtained on the relationship between extroversion and mathematics achievement. Several themes emerged, for example, one theme that emerged was that extroversion enhances willingness to learn. Learning is the acquisition of knowledge and skills through study, experience or being taught. In the context of the study, learners who are extrovert are free to learn, can make their areas of difficulty known, are willing to learn new ideas, are concerned and ready to consult and be guided. One respondent remarked: "*..... some outgoing students are very good in Maths because they can make their own areas of difficulty known.*" (Teacher, 2)

Two other respondents who also believed that extrovert personality trait has a direct influence on Maths achievement reiterated.

"*Good performance, since they can tell their mind and its easy to identify their problems*" (Dp 1) "*Outspoken students are good performers since they are concerned and are ready to consult and be guided. They are willing to learn new ideas.*" (H.O.D 2)

The excerpts from Dp 1 and H.O.D 2 implied that extrovert students perform well in Mathematics since they are free and willing to learn new ideas as well as be guided, hence boosting their self-confidence and improving performance in Mathematics. Apeh *et al* (2015) findings found significance of difference between subject preferences between students showing extroverted and introverted traits as well as significant difference between the academic

performances of students due to personality type. However, Moh Hasbullah Isnaini (2017) concluded that the effectiveness of the collaborative work does not depend on the social orientation because both introverts and extroverts who work collaboratively are always superior to the groups who work individually.

Qualitative results were obtained on the relationship between extroversion and mathematics achievement. Several themes emerged, for example, one theme that emerged was that extroverts tend to display good performance. Good performance is the ability to reflect good scores after an exercise of academic perspective. A respondent emphasized that outspoken students: *“Readily and easily ask questions and seek to consult”* (H.O.D 5)

This is in bid to ensure that commendable performance is achieved. It is also worth noting that these outspoken and outgoing learners can perform well in Maths as expressed by the following respondents:

“The outgoing students absorb better because they are free to ask what they do not understand and practice a lot of Maths” (Dp 6)

“Outspoken students are good performers since they are concerned and ready to consult and be guided” (H.O.D 2)

“Outspoken do better in Maths as compared to introverts” (H.O.D 4)

As observed from the above excerpts, it is confirming that outgoing and outspoken students are capable of performing better in Maths since they are willing to consult and be guided. They are also free to ask what they don't understand as well as practice a lot of Maths. According to cognitive psychologists Daniel Willingham, he proposes that practice and rote learning are essential in speeding up the quest for better results in mathematics as this allows the learner to devote more of their cognitive resources towards higher level understanding. This finding agrees with Gruber, and Cunningham (2015) who suggested extraversion and neuroticism were significantly related to both subjective happiness and hypomania risk, but this effect was dependant on the specific factors of each trait. Similarly, Madeleine (2013) results indicated that extroversion was the only trait to have a significant relationship with achievement, showing that students who were more extroverted scored higher on the test.

4. Conclusions & Recommendations

There was a positive correlation ($n=878$; $r=.353^{**}$; $p<.01$) between Being extrovert and Mathematic scores among students, it was statistically significant. Qualitative results were obtained on the relationship between extroversion and mathematics achievement. Several themes emerged, for example, one theme that emerged was that extroverts tend to display good performance. Good performance is the ability to reflect good scores after an exercise of academic perspective. Another theme that emerged was that extroversion enhances willingness to learn. Learning is the

acquisition of knowledge and skills through study, experience or being taught. Its recommended that teachers should purpose to blend this personality with others during group activities since these individuals are aggressive hence able to influence positively.

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