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FACTORS AFFECTING THE MATHEMATICS LEARNING OUTCOME OF UNDERACHIEVING STUDENTS AT COLLEGES OF EDUCATION

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Abstract
The performance of a student in school is important to the educational system for making informed decisions about the progress of the students. However, there are many instances where students face challenges that influence their performance in Mathematics at all levels of education. This study, therefore, narrowed down on the perceived factors that affect student Mathematics performance at Colleges of Education. The analytic descriptive survey design was employed. The population of the study was all the 240 level 100 students from three programmes of study at a College of Education in the Hohoe municipality, Ghana. A total of 103 students participated in the study. Krajcie and Morgan (1970) formula was applied to estimate the sample size of the study. A diagnostic approach was used to identify the underachieving students with grades of C5 and C6 on entry into College from Senior High Schools (SHS) for inclusion in the study. A 20-item instrument titled "Learning Factors Scale (LFS)" and student end-of-semester Mathematics results were used for data collection. The LFS was validated by experts in Mathematics Education and the reliability test was computed using the Cronbach Alpha formula which yielded a value of 0.84. Data were analyzed using percentage distribution, Relative Importance Index (RII) and ranking (R_k). The aim was to determine which of the four factors explored, viz: Student-related Factors(SRF), Tutor-related Factors(TRF), Parent-related Factors (PRF) and College-related Factors(CRF) mostly affected the learning outcomes of the students in College Mathematics. The result shows that CRF was ranked as the most significant factor affecting student performance in Mathematics among the four factors. This was followed by PRF, SRF and TRF in that order. The result further showed that the factors respectively had weak and inverse relationships with the performance of the students in Mathematics. It was recommended among others that attention should be given to the four factors in teaching and learning Mathematics at College, especially CRF and PRF.

Keywords: Student-related factors, Tutor-related factors, Parent-related factors, College-related factors

Introduction

The traditional teaching method is still utilized in teaching Mathematics in Ghana, Nigeria, and most African countries. In such a teaching method, the teacher attempts to meet the needs of all students in the classroom. However, it is largely perceived that many students still perform poorly in Mathematics when the traditional teaching method is utilised. Loss of interest in learning Mathematics is also attributed to the use of the traditional teaching and learning approach. This supports the fact that many students in Ghana dislike Mathematics, hence only a few students accept to offer Mathematics at school whenever there is an option. Given this, the ability to develop student Mathematics performance and interest is a major concern to educational authorities and Mathematics teachers, particularly for low-performing students.

An experimental game ("Math-Island") was designed to enhance student interest and performance in Taiwan. A total of 215 grade two and three learners took part in the study for two years. Math-Island is a game that helps the

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students to learn using their tablets both at school and home. They compared two independent groups (experimental & control) and revealed that student performance in Mathematics improved through the use of Math – Island. It was also stated that both low and high performing students in the experimental group has equal rates of interest in learning Mathematics after using the designed game (Yeh, et. al., 2019). The contribution of the article highlights the effort teachers make in an attempt to help students to achieve the best in Mathematics at the College level. Students still struggle to pass Mathematics even at the College level due to poor foundations in Mathematics at the pre-tertiary level where they are taught to learn and pass Mathematics by memorization without conceptualization. Ukobizaba et al. (2021) reviewed articles from 1997 to 2020 about Mathematics assessment strategies and argued that Structure of the Observed Learning Outcomes (SOLO) taxonomy, Higher - Order Thinking Skills (HOTS), video games-based and cooperative learning which is based on learner-centred approach can be used extensively to develop student interest and improve performance in the Mathematics and also enhance student mathematical problem-solving skills.

Teacher dominated classroom known as the traditional approach to teaching and learning is relegated to modern education and continuous learning. Therefore, teacher educators particularly in Mathematics are attempting to design various means by which students will be motivated and develop an interest in the subject. Some of the emphasized strategies are (1) Problem-based learning where scenarios are created for students to think critically and discover concepts for themselves, (2) Play-based learning, where the teacher design activities for learners using games that create fun to reduce the tensed Mathematics classroom environment that is known in the traditional setting. These two strategies are learner-centred approaches to learning Mathematics at all levels of education in Ghana today. However, little implementation and impact are recognized so far despite the curriculum reform and series of training by Non – Government Organisations (NGOs), the Ministry of Education and the Government as a whole. Therefore, attempting to enhance student interest and performance in Mathematics; ability to conceptualize and apply mathematical knowledge to various situations remain a major concern for which this study intends to find out if Student, Tutor, Parent and College-related Factors could affect student Mathematics achievement even at the College level.

The learning and academic achievement of students are influenced by a lot of factors, including but not limited to Student-related factors, Teacher-related factors, and Parent-related factors and system (institutional)-related factors. In Tanzania, it was revealed that there was a positive relationship between student attitude and Mathematics performance. However, the specific weighting of the associations between variables showed that as students move from lower stage to higher stage (from primary to secondary to College) their attitude toward Mathematics reduces. Therefore, it was established in the study that there was a weak but positive correlation between student attitudes and performance in Mathematics. In addition, it was argued that teacher factors, teaching-learning resources, school environment and socio-economic factors are connected to student lack of interest and motivation in studying Mathematics and hence affect their performance (Mazana, et al., 2019). Although a perception made students believe that Mathematics is difficult, particularly at the higher education level Student confidence determine their interest in Mathematics in school. There is an indirect association between student confidence and motivation to do Mathematics. Student interest in Mathematics is likely to increase if only the student understands the application. (Otoo, et al., 2018). It is unclear about the link between teaching-learning practices and student achievement in the study area. The identified limitations form the key objective of this paper investigating the extent to which Student-related factors, Tutor-related factors, Parent-related factors, and College-related factors affect the academic performance of the students in Mathematics.

Student performance in Mathematics depends on many attributes of teaching and learning in particular. It was stated that the interest and motivation of many students who like or dislike Mathematics are a result of two main factors, thus teacher support and learning environment (Mueller, et al., 2011). The learning environment goes beyond the physical arrangement of the classroom; it is about the extent to which resources are displayed, that tell how Mathematics is valued and welcoming to students and teachers. Teachers are therefore supposed to utilize the available resources and the classroom setting to support learning by creating enabling Mathematics atmosphere. The finding, therefore, assumed that Teacher and School factors form the basis of student Mathematics achievement. In a similar study, Enu, et al., (2015) investigated factors that influence students performance in Colleges of Education in Ghana. They focused their research on school-related factors and argued that insufficient availability of teaching

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resources and teacher instructional approach affect the interest and motivation of the students who performed below expectations.

Elsewhere, teacher competency in Mathematics is suggested as one of the major constraints to student Mathematics performance and interest. In addition, it was stated that instructional strategies and teaching approaches employed by the Mathematics teachers are key factors that affect student interest (Saritas & Akdemir, 2009). Similar findings were made by Osena, (2007), who established that there was a negative attitude toward the teaching of Mathematics by teachers. It was again stated that a poor learning environment and inadequate teaching resources are associated with the poor achievement of the students. These emphasize that to develop student interest and motivation in learning Mathematics effectively teacher factor, learning environment as well as adequate and appropriate resources are very essential. It is interesting to note that almost all the above studies are of the view that teacher and school factors as the main constraints to student achievement in Mathematics at the College level. Even though the investigations took place in different settings, their findings are similar and suggest similar solutions to the identified possible factors. However, they equally emphasise the attitude of the students toward their interests and motivation. It was indicated that most students have a negative attitude towards Mathematics and hence could not perform well in it. Teacher, Parent, and School-related factors seem to be more responsible for the student factors in the long term.

Among other factors influencing the performance of Mathematics at College, student-related factors play an important role in how students perform in Mathematics at College. Odogwu and Aliogo (2015) indicate that there is a strong relationship between student attitude and Mathematics performance. Similar findings were revealed by some other scholars (Roh, 2003; Paksu, 2008; Schenkel, 2009). According to them, basic school children investigation on attitude and Mathematics achievement have a positive and strong relationship between the two variables. It was also revealed that students prefer to solve Mathematics problems using memorized formulas with steps rather than understanding the concepts. This attitude made them less confident; reduced their critical thinking and also demotivated them from studying and doing Mathematics (Ayebale, et al 2020). In like manner, the teacher factor was highly identified as the factor that affects student achievement. This means that students often rely on teacher factors to develop their attitude towards the study of Mathematics. It was argued that good teacher-student relationships increase student interest and also motivate them to study Mathematics respectively. The study continues to suggest that the positive nature of the teacher in the Mathematics class improves student performance in Mathematics. The Parent-related factors cannot be overlooked since parents serve as the first role models and source of inspiration to their children. This suggests that parent physical and provisional absenteeism can influence student Mathematics performance negatively even at the College level.

More recent studies such as (Maamin et al., 2021; Huang, et al., 2021; Tomul, et al., 2021) in support of the earlier findings also indicate that student performance in Mathematics is influenced by several indicators which are grouped under Student-related factors, Teacher-related factors, Parent-related factors and School-related factors. Meanwhile, society instead of arguing about the wholistic contribution of factors that account for the low achievement of students in Mathematics rather report on limited student-related factors leaving other factors unaddressed. Maamin, et al. (2021) specifically state that sex, demographic information, skills, knowledge, attitude and engagement are student-related factors that influence Mathematics performance. They also reported that the socioeconomic background of parents is the main parent-related factor that affects student performance in Mathematics. However, Huang, et al. (2021) argue that parent or family-related factors are multidimensional and are more of an emotional influence on children in school. They stated that the dynamic issues include “cognitive involvement, behavioural involvement, and personal involvement, which serves as mediating effects of student’s mental health and Mathematics self-efficacy”. School factors that influence Mathematics achievement are school engagement, facilities and infrastructure.

Another study vehemently outlined that “ discipline, language barriers and learner attitudes are student-related factors that influence Mathematics performance, while “teachers’ factors included lack of pedagogical content knowledge and skill, and lack of appropriate professional training” (Mabena, et al., 2021). Similarly, Chand, et al. (2021) established that students have a negative attitude toward learning Mathematics. It was also stated that “ineffective Mathematics curriculum in secondary schools was the reason behind poor performance in the subject.

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Moreover, many of the primary school teachers lacked potential and competence to teach Mathematics at primary school levels, and this largely contributed toward the lack of interest amongst students, hence translating into poor achievement at both upper and lower secondary levels." Meanwhile, it was argued that secondary school teachers rather have a positive attitude towards the teaching and learning of mathematics. This was as a result of the teachers "good quality, performing, and fully qualified as far as the teaching of Mathematics and delivery of the subject matter were concerned."

In literature, it is evident that almost all findings touched on the existence of various indicators contributing to student performance in Mathematics. Some of the indicators are student lazy attitude towards Mathematics, indiscipline by students, the perception that Mathematics is difficult, teacher behaviour, effective use of pedagogy, unavailability of teaching resources, school management and planning, parent socio-economics problems as well as some educational policies. Several of these indicators are grouped under four sections: student-related factors, tutor–related factors, parent-related factors and school-related factors. Despite the several studies in the area, it seems little has been done on the same issue at the College level.

Problem Specification

The underachievement of College students in Mathematics is a recurring situation over decades. This has been a worrisome issue to the Mathematics tutors of Colleges of Education in Ghana and the Government as a whole. Although many students from SHS qualify to enrol into the College of Education, the majority of them enter with grades between C4 to C6. However, teaching and learning at the College of Education have a different dimension from what such students experienced at SHS. So this study identifies the most important factors amongst Student-related Factors(SRF), Tutor-related Factors(TRF), Parent-related Factors(PRF) and College-related Factors(CRF) affecting student Mathematics performance at the College of Education in the Hohoe municipality, Ghana.

Purpose of the Study

The purpose of the study is to determine the factors affecting the Mathematics performance of students at the College of Education. The following specific objectives were formulated to:

1. determine the SRF affecting student performance in Mathematics at Colleges of Education
2. find out the TRF affecting student performance in Mathematics at Colleges of Education
3. determine the PRF affecting student performance in Mathematics at Colleges of Education
4. find out the CRF affecting student performance in Mathematics at the Colleges of Education
5. determine the relationship between the identified factors and the Mathematics performance of students at the Colleges of Education.

Research questions

The following research questions guided the study:

1. What are the SRF affecting student performance in Mathematics at the Colleges of Education?
2. What are the TRF affecting student performance in Mathematics at the Colleges of Education?
3. What are the PRF affecting student performance in Mathematics at the Colleges of Education?
4. What are the CRF affecting student performance in Mathematics at the Colleges of Education?
5. What is the relationship between the identified factors and the Mathematics performance of students at the College of Education?

Hypothesis

The following hypothesis guided the study:

H_{01}: There is no significant relationship between each of the identified factors and the Mathematics performance of underachieving students at the College level.

Materials and Methods

Design: The study employed the analytic descriptive survey design. This design was employed because the study collected the opinions of the students regarding the constraints to effective instructional delivery and also tested a hypothesis to link these factors.

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Participants: A total of 148 students were sampled for the study based on Krajcie and Morgan (1970), using simple random sampling from a population of 240 level 100 students from three programmes of study in a College of Education in the Hohoe municipality. Purposive sampling was used to select students with weak grades, based on their entry grades to College from senior high schools (SHS). The cut-off points for the SHS grades considered as weak grades are C5 and C6. The researchers identified 52 Primary Education students, 32 Early Childhood Education students and 19 Home Economics Education students, being a sum of 103 participants for the study. The ages of students ranged from 18-30 years.

Instrumentation: The instruments used for data collection were the Learning Factors Scale (LFS) and Student Achievement Test (SAT).
LFS: This was designed based on four constraints to the study of Mathematics (a) Student-related Factors (SRF), (b) Tutor-related Factors (TRF), (c) Parent–related Factors (PRF) and (d) College-related Factors (CRF). Each factor was measured with five items and this summed up to 20 items. The LFS employed the use of a four-point Likert scale, thus 1 = strongly disagree, 2 = disagree, 3 = agree and 4 = strongly agree. The reliability test was computed on the LFS using the Cronbach Alpha formula which yielded a value of 0.84. This indicates that the instrument had a good level of internal consistency.

SAT: The test was an end of semester result which was categorized into four, viz: Poor (0-49%), Average (50-64%), Good (65-79%) and above Excellent (80-100%). The average score of the performance of the students was 66.5%. The SAT yielded the student performance data that was used for correlating with the learning factors to ascertain the nature of their respective relationships. The direct method of administration was adopted. A total of 103 copies of the LFS was administered to the participating students in their respective classes to fill and the researchers retrieved the completed copies administered after filling to avoid instrument mortality to obtain a 100% return rate,

Data analysis: The Relative Importance Index (RII) and ranking were used to answer the research questions to identify the key factors inhibiting the learning of Mathematics among underachieving students. The Spearman Rho was used to test the hypothesis at a .05 level of significance. In using Relative Importance Index (RII) suitable for ordinal variables on a rating scale (Gunduz, et al., 2015) which was computed using the equation below:

$$RII = \frac{\sum W}{A*N} (0 \leq RII \leq 1)$$

W – Is the weight given to each factor.
A - Is the highest weight (i.e. 4 in this case).
N – Is the total number of respondents.
RII=1-Strong constraints to effective teaching and learning.
RII=0-Not constituting major constraints to effective teaching and learning.
RII =0 to 1 is the decision rule or the probability value.

So the nearer the value of RII to 1 the higher the problem or the challenge/factor, in this case, the higher the probability of that factor being a major constraint to the teaching and learning of Mathematics

Results
The results present the descriptive and inferential statistics of the data collected during the study. The first part of the presentation showed the percentage distribution while the second part presented the Relative Importance Index (RII) and Rank (R_k) of responses on the various items based on the four factors.

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Table 1: Percentage distribution and RII on Student-related Factors (SRF)

Student Related Factors (STF)	SD	D	A	SA	RII	Rank
1. I have interest in doing College level Mathematics	20.4	18.4	26.2	35.0	0.69	4.0
2. I am motivated to study Mathematics in College	20.4	21.4	11.7	46.6	0.71	2.0
3. I am satisfied duing Mathematics lessons in College	29.1	18.4	29.1	23.3	0.62	5.0
4. College mathemtics enhance my interest to study Mathematics	22.3	13.6	25.2	38.8	0.70	3.0
5. It is very interesting to study Mathematics at the College level	18.4	18.4	16.5	46.6	0.73	1.0
Grand Mean					**0.69**	**4.0**

From Table 1, it was shown that student interest to study Mathematics at the College level obtained the highest (RII = 0.73, R_k = 1). This was followed by the student motivation to study Mathematics at College with RII = 0.71 and R_k = 2. The least ranked item under the STF was student satisfaction during Mathematics lessons in College, thus (RII = 0.62, R_k = 5). The grand mean was RII = 0.69 with R_k = 4.0.

Table 2: Percentage distribution and RII on Tutor-related Factors (TRF)

Tutor Related Factors (TRF)	SD	D	A	SA	RII	Rank
6. My tutors encourage me to practice Mathematics every day	6.8	24.3	35.9	33.0	0.74	2.0
7. Tutors provide me with the necessary material that will aid me to study Mathematics	16.5	10.7	39.8	33.0	0.72	3.0
8. Tutors explain College level Mathematics with real life situation	6.8	31.1	42.7	19.4	0.69	4.0
9. Tutors create friendly atmosphere in the Mathematics classroom	35.9	48.9	9.7	5.8	0.88	1.0
10. Tutors are competent to handle College level Mathematics to my satisfaction	1.0	16.5	13.6	68.9	0.00	5.0
Grand Mean					**0.61**	**5.0**

Table 2 showed the five items under the Tutor-related Factor (TRF) and the RII. It was found that the first ranked facto “tutors create a friendly atmosphere in the Mathematics classroom” with RII = 0.88 and R_k = 1. The second-ranked item was “my tutors encourage me to practice Mathematics every day” (RII = 0.72, R_k =2). The last item was “tutors are competent to handle College-level Mathematics to my satisfaction”, this was rated at (RII = 0.00, R_k = 5). The grand mean RII was 0.61 and R_k = 5.0

Table 3: Percentage distribution and RII on Parent-Related Factors(PRF)

Parent Related Factors (PRF)	SD	D	A	SA	RII	Rank
11. My parent provide me sufficient material for study Mathematics	14.6	15.5	35.9	34.0	0.72	3.0
12. My parents are concerned with my performance in Mathematics	10.7	22.3	46.6	20.4	0.69	5.0
13. My parent support me Mathematics concepts during holidays	6.8	23.3	36.9	33.0	0.74	2.0
14. My parent challenged me to do Mathematics at College	11.7	17.5	42.7	28.2	0.72	4.0
15. My parent encourage me to do or study Mathematics	2.9	14.6	39.8	42.7	0.81	1.0
Grand Mean					**0.74**	**2.0**

Table 3 presents the result of the rated items on PRF in order of RII and ranking. The result shows that item 15 was ranked the highest or the most important factor based on the participants' view. Thus, “My parent encourages me to do or study Mathematics” (RII = 0.74, R_k = 1). The result shows that the least rated item was “My parents are

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concerned with my performance in Mathematics" with RII = 0.69 and R_k = 5. The grand mean RII was 0.74 and R_k = 2.0.

Table 4: Percentage distribution and RII on College-related Factors(CRF)

College Related Factors CRF)	SD	D	A	SA	RII	RANK
16. There are appropriate teaching and learning resources to study Mathematics at College	4.9	8.7	42.7	43.7	0.81	1.0
17. My College usually organised Mathematics workshop for us	8.7	6.8	40.8	43.7	0.80	3.0
18. The College motivate students to do Mathematics in College	6.8	9.7	37.9	45.6	0.81	2.0
19. My College provide a good learning environment for us to study Mathematics	3.9	21.4	38.8	35.9	0.77	5.0
20. My College have accessible infastructure for students to study Mathematics	4.9	11.7	43.7	39.8	0.80	4.0
Grand Mean					**0.80**	**1.0**

Table 4 showed that "there are appropriate teaching and learning resources to study Mathematics at College" was the highest-rated item with RII = 0.81, and R_k = 1. This was followed by "the College motivates students to do Mathematics in College" (RII = 0.81, R_k = 2), while "My College provides a good environment for us to study Mathematics" was ranked the least (RII = 0.77, R_k = 5). The grand mean RII was 0.88 and R_k = 1.0.

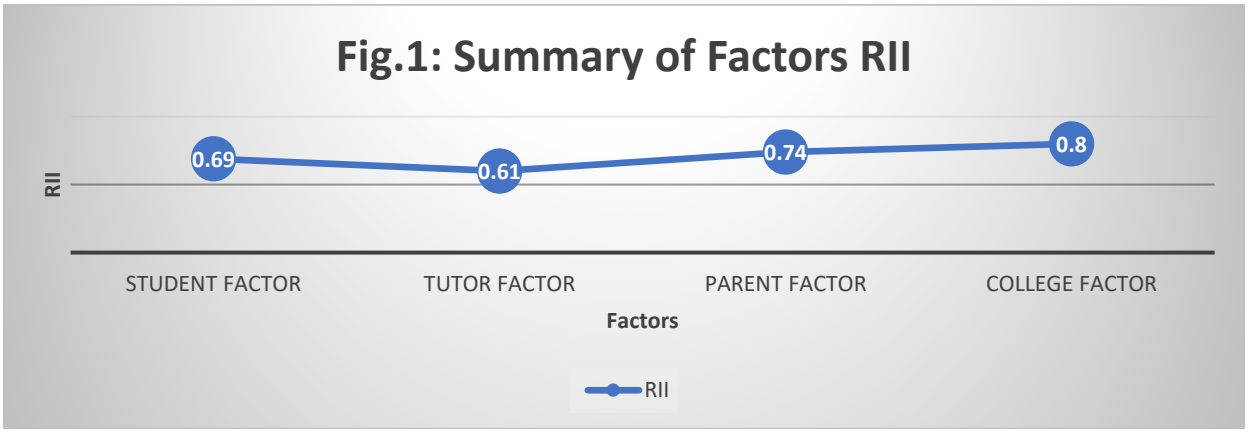

Figure 1 showed the summary of the factors based on RII. It was shown that CRF (RII = 0.80, R_k = 1) was the most RII ranked among the four factors. This was followed by PRF (RII = 0.74, R_k = 2), SRF (RII = 0.69, R_k = 3) and TFR (RII = 0.61, R_k = 4). This indicated that CRF was the most important factor while TRF was the least factor.

Table 5: Summary of Spearman's Rho Correlation between student performance and factors that influence College level Mathematics

Variable		Performance	SRF	TRF	PRF	CRF
Performance	ρ	1.000				
	p-value	.				
Student	ρ	-.036	1.000			
	p–value	.717	.			
Tutor	ρ	-.024	.157	1.000		
	p–value	.807	.114	.		
Parent	ρ	-.005	.356**	.341**	1.000	
	p–value	.961	.000	.000	.	
College	ρ	-.007	.313**	.231*	.579**	1.000
	p–value	.941	.001	.019	.000	.
	N	103	103	103	103	103

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

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

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The summary in Table 5 presents Spearman's Rho correlation between factors and student performance in Mathematics. It was interesting to note that all four factors (SRF, TRF, PRF & CRF) had a negative and very weak correlation with student performance in Mathematics. This explained that the four factors considered in this study may not have any significant effect on student results. It however suggests that the Mathematics Performance of the students is inversely related to the factors explored.

Discussion

The findings in Tables 1-4, revealed that there is a precise concern about student interest and motivation towards the study of Mathematics at the College level. Participants seem to ascertain that their tutors encourage them to study Mathematics at College while the College also motivates them to do Mathematics. In the two factors TRF and CRF, the interest and motivation to do Mathematics were ranked high, thus (RII = 0.74, R_k = 2 and RII = 0.81, R_k = 2) respectively. Meanwhile, issues of satisfaction regarding the study of Mathematics were ranked the least (SRF, RII=0.62, R_k=5). "Tutors are competent to handle College-level Mathematics to my satisfaction" was rated least on TRF(RII = 0.00, R_k = 5). This suggests that the participants least deemed the statement as important to them. In other words, express their displeasure about the tutor competency during Mathematics lessons. Although the participants indicated that their parents also encouraged them to do or study Mathematics, they were not much concerned about their performance in Mathematics at the College level. The overall findings regarding the factors affecting student Mathematics at the Colleges of Education established that the key constraint to effective teaching and learning of Mathematics was College-related Factors(CRF), this was followed by the Parent-related Factors (PRF), the Student-related Factors(SRF) and Tutor-Related Factors(TRF), in that order.

The Spearman's correlation of the factors with the Mathematics performance scores of the students obtained from their end of semester results showed that College-related Factors (ρ=-0.007, p=0.941), Parent-related Factors(ρ=-0.005, p=0.961), Tutor-related Factors (ρ=-0.024, p=0.807) and Student-related Factors(ρ=-0.036, p=.717) are inversely related to the performance of the students in Mathematics. The negative correlations imply that any increase in the value of each of the factors explored is not likely to yield a concomitant increase in the performance of the students. However, the relationships between the factors and the performance of the students in Mathematics was weak and not significant statistically. Given the findings, the literature also opined that student factors are the most important issues to consider when rating student performance in Mathematics. This often happens when tutors demonstrate a positive attitude toward facilitating instructions of the subject. The learning environment has been found to influence learning outcomes. If the institution can provide enough and appropriate teaching and learning resources for both tutors and students to learn Mathematics there will be an improvement in the performance of the learners. It was mentioned that the interest and motivation of many students in Mathematics is a result of two key aspects, namely teacher support and learning environment (Mueller, et al., 2011). The learning environment encompasses more than just the classroom's architectural layout; it also includes the amount to which resources are displayed, which demonstrates how Mathematics is valued and welcomed by students and teachers. Teachers must therefore make use of available materials and the classroom environment to foster learning by providing an enabling Mathematics environment. The teacher and school factors had a role in student Mathematics achievement (Enu, et al., (2015; Ayebale, et al., 2020; Huang, et al., 2021).

Conclusion

This study based on the RII and the grand mean ranking indicated that College-related Factor (CRF) was rated as the most relative importance factor affecting student Mathematics performance at College whereas the Tutor-related factor was considered the least. The factors respectively had negative but not significant correlations with the performance of the students in Mathematics. This implies that the identified factors based on criterion mean rating of 3.0 are currently constraints to effective teaching and learning of Mathematics at the Colleges of Education and since they respectively had an inverse relationship with the performance of the students in Mathematics.

Recommendations

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

1. Mathematics tutors should pay attention to the factors related to instructions that could impact the learning outcomes of the students

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2. Students should be motivated and have an interest to do and study mathematics at College by creating self–efficacy as well as being determined
3. Parents should support and challenge their wards to do mathematics at College
4. The College should create a good atmosphere for students to study Mathematics in College.

Further studies

Based on the scope of the study the following suggestions were made for replication:

1. The scope of the study should be increased to attain a generalization of the findings.
2. This study could not explore the qualitative approach to complement the quantitative findings, hence it is suggested that future studies should employ the mixed-method approach.
3. Future studies should consider an alternative statistical approach beyond where this study has ended.

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