

RESEARCH ARTICLE

AN INVESTIGATION OF FACTORS AFFECTING STUDENTS' PERFORMANCE IN MATHEMATICS: A CASE STUDY OF LANDMARK UNIVERSITY

¹Asiru, Tajudeen Motunrayo, ²Ogunjimi, Mayowa Olurotimi, ³Akinremi, Oluwadamilare Joseph, ³Aladeitan, Boluwaji Benedicta, ³Oluwayemi, Matthew Olanrewaju, ³Idumufinide, Tamara-Preye

¹Department of Mathematics and Computing Science Education,
Emmanuel Alayande University of Education, Oyo, Nigeria.
tunra2014@gmail.com

²Department of Adult and Primary Education, Faculty of Education, University of Ilorin, Ilorin, Nigeria.
ogunjimi.mo@unilorin.edu.ng

³Department of Physical Sciences (Mathematics Programme).
Landmark University, Omu-Aran, Nigeria
SDG 4: Quality Education Research Group,
Landmark University Omu-Aran, Nigeria.
akinremi.joseph@lmu.edu.ng, aladeitan.beedicta@lmu.edu.ng, idumufinide.tamara-preye@lmu.edu.ng

³Department of Physical Sciences (Mathematics Programme).
Landmark University, Omu-Aran, Kwara State, Nigeria
Department of Mathematics and Statistics,
Margaret Lawrence University, Galilee, Delta State, Nigeria,
SDG 4(Quality Education Research Group),
oluwayemi.matthew@lmu.edu.ng

Correspondence author

Abstract - The research study adopts a descriptive survey design method to investigate the factors affecting students' performance in Mathematics at Landmark University. Primary data was collected directly from the intended recipients via a questionnaire using Google survey link and interview technique which was conducted while the questionnaire was distributed to the student community in the selected Departments or Programmes, with the aim of reaching 240 respondents. The record examination scores for selected mathematics courses that cut across some major programmes and departments such as Mathematics, Physics, Chemistry, Biochemistry, Microbiology, Computers Science, Electrical and Information Engineering (EIE), Agric and Biosystem Engineering (ABE), Mechanical Engineering, Mechatronic and Civil Engineering were also considered and analysed using descriptive statistics, Correlation technique. The work shows some factors that affect students' performance in mathematics at Landmark University and also established some correlation between some selected mathematics courses in the University.

Keywords - Mathematics, performance, teaching methodologies, factors affecting Mathematic, and Pearson correlation

1.0 INTRODUCTION

An in-depth analysis of previous research on factors influencing students' academic performance uncovers intriguing insights as to factors influencing students' performance in mathematics. No doubt, mathematics is a bedrock of science and technology and the advancement of any nation in terms of science and engineering cannot be disconnected to how much mathematical knowledge and skills that are applied to advance the course of her technology. [1] citing [2] identify mathematics as the bedrock of science and technology. Mathematical concepts are not only applicable in science and engineering but every facet of human endeavours. Mathematics is widely used in economics, accounting, sociology among others and the more knowledge of mathematics an individual has, the easier it become to have better grasps of other applications. This is why mathematics (as a universal language of science and technology) and English Language are made compulsory by Nigerian government up to secondary school education at least. Hence, the knowledge of the subject and factor affecting students' performance in it becomes imperative.

Scholars globally have investigated various predictors of academic success, including demographic characteristics, age, parental education, socioeconomic status (SES), the academic study environment, social media usage, gender, sleep duration, income, and more. Demir in [3] highlighted the strong influence of family background and student factors, including grade, work status, scholastic activities, gender, parental support, and well-being at school, on academic achievement. Tastan in [4] discovered that nationality, teacher efficacy, and motivation are significant factors affecting academic performance. Hijazi and Naqvi in [5] revealed a negative link between household income and intermediate students' exam performance.

Khezrimotlagh in [6] investigates the effects of gender, age, place of origin, post-secondary level result, and the CGPA of entry qualification on first-year undergraduate students' academic achievement, revealing that the CGPA of entry qualification is the most important determinant of a student's Cumulative Grade Point Average (CGPA). Rosemary in [7] explored factors such as finance, age, language proficiency, family responsibilities, academic aspirations, and Student-Faculty interactions, all of which affected graduate students' academic performance and time management, workload regulations, and academic mentorship were recommended to enhance performance. Ali *et al.* in [8] discovered a significant beneficial association between learning approaches, home-related factors, study habits, and student academic achievement. Effective learning techniques and study habits were linked to better performance.

1.1 Student-Related Factor

Harb and El-Shaarawi in [9] conducted a study at the College of Business and Economics, UAEU, to identify factors influencing students' performance. The research involved 864 students and employed regression analysis. The findings revealed that English competence, active class participation, and taking leave positively affected performance. On the other hand, frequent absences and living in crowded households had negative impacts. Naqvi in [10] undertook a study to assess the elements impacting students' success in private institutions. The study concentrated on the association between student performance in intermediate examinations and various factors, including students' attitudes toward study time, class attendance, and parents' income. Steenkamp *et al.* in [11] did a study at a South African institution comparing instructors' beliefs with students' assessments of elements determining performance in first-year accounting. Low-class attendance, inadequate preparation, insufficient time, and a lack of English training were recognised as the primary causes contributing to low performance in the research. According to Abbasi and Mir [12], students play essential roles in earning excellent results and should thus utilise all chances accessible within their academic environment.

Ali *et al.* in [13] undertook a case study to evaluate the factors influencing graduate students' academic performance at Islamia University's Sub-Campus in Bahawalpur, Pakistan. Age, gender, schooling history, Faculty of study, socioeconomic level of father, residence location, medium of education, tuition trend, and daily study hours were among the independent factors studied. The dependent variable was the pupils' academic achievement as indicated by their grades/marks. A systematic questionnaire was utilised to collect data from 100 students who were chosen at random. Linear regression, descriptive analysis, and correlation analysis were used to examine the data. The data revealed that the father's socioeconomic

position, age, and daily study hours all had a substantial impact on student's academic achievement. The study developed a linear model that may be used to improve the academic performance of university students. Alam *et al.* in [14] investigated the variables impacting undergraduate students' academic success at International Islamic University Chittagong (IIUC), Bangladesh, and data from 200 undergraduate students were collected using a structured questionnaire and analysed using simple percentage calculations and a linear regression model. The findings revealed an overall CGPA of 3.25 for IIUC students. Factors such as gender, past academic track record, age, class attendance, and medium of education were found to significantly influence students' academic performance.

Reda and Mulugeta in [15] conducted a study at the Engineering College of Debre Berhan University in Ethiopia to explore the elements that influence pupils' academic achievement. The study included 263 participants, and self-administered questionnaires were used to collect data. Descriptive statistics were used to analyse. The findings showed that student interest, study habits, and previous background factors significantly influenced academic performance. The study suggested assigning Departments based on students' interests, promoting effective study habits, and considering students' previous backgrounds to enhance engineering students' performance. Peteros *et al.* in [16] undertook a study to investigate the factors impacting the mathematics performance of Grade 10 pupils at a Public National High School in Cebu, Philippines. The study used a descriptive correlational approach and data was obtained using a survey questionnaire that assessed Mathematics students' self-concept and academic accomplishment. Self-concept and academic achievement in Mathematics were found to have a strong link.

Jony [17] conducted a study in Bangladesh to determine the important elements impacting first-year undergraduate students' academic achievement. A survey questionnaire was administered to 450 students from public and private universities using stratified and convenient simple random sampling methods. The research indicated that factors such as appropriate choice of course, student interest, regular attendance, timely examination preparation, teachers' pedagogical skills, effective communication, and study methods positively influenced academic performance. Conversely, factors such as lack of interest, inadequate exam preparation, irregular attendance, late assignment submission, lack of self-discipline and motivation, poor information prioritisation, heavy workload, and inefficient time management negatively affected academic performance.

1.2 Teacher-Related Factor

Chand and Sharma [18] conducted an exploratory study on senior secondary science students in Himachal Pradesh, India, to identify the elements influencing their academic achievement. They analysed data from 450 students across 50 schools and found that factors such as hours of self-study, performance in the 10th-grade examination, family income, mother's education, teacher's salary, and teaching experience significantly influenced students' achievements. They highlight the importance of these factors in shaping the academic outcomes of senior secondary science students. Hassana in [19] studied the factors affecting students' academic achievement at the Department of Mathematical Sciences at two tertiary Institutions. The study revealed a low level of performance in Mathematics in the College of Education (COE), Ankpa, with slightly better results observed at Kogi State University (KSU), Anyigba. Factors identified as influencing student performance included teaching methods, inadequate Mathematics lecturers, lecturers' qualifications, and students' attitudes and interests. The study also emphasised the significance of students' previous performance and the interaction between lecturers and students.

Adeyemi and Adeyemi [20] investigated institutional factors affecting the academic performance of students. The study found that lecturers' interest and commitment, student-teacher ratio, teaching methods, and school calendar stability significantly predicted academic achievement. However, school leadership, facilities, and library resources did not show significant influence. The findings offer recommendations to improve educational policies and enhance students' educational performance. Ayodele *et al.* in [21] investigated the variables affecting the academic performance of students studying real estate in Nigeria.

The work involved 152 final-year students from two Universities. It was reported that factors related to academic assessment and teaching methods significantly impacted students' performance. Abdelnaser and Mohamed in [22] found that English language and communication skills, teaching style, language assessment, students' self-concept, and academic stress played important roles in academic achievement of students at a business college in Malaysia.

Eratl and Şahin in [23] investigated the factors affecting the performance of students at the School of Physical Education and Sport at Çukurova University and Kahramanmaraş Sütçü İmam University, focusing on the School of Physical Education and Sport. The study included 360 students from two Universities in Turkey and utilised logistic regression analysis. The results revealed that variables such as gender, University attended, choice of Department, and father's education significantly influenced academic success. Factors like counseling, support from instructors, and communication with instructors were also found to impact success. The study emphasised the importance of instructors' guidance, support, and communication skills in facilitating student success. Ayebale *et al.* [24] conducted a rapid systematic review focusing on factors influencing students' performance in secondary schools in developing countries in Mathematics. The study analysed (26) articles and identified key factors such as teaching methods and teachers' attitudes. The findings underscore the significance of addressing these factors early in students' academic journeys to encourage higher enrollment in statistics at the tertiary level.

1.3 System-Related Factor

According to Devadoss and Foltz [25], an enhanced physical environment promotes comfort, security, and a better grasp of courses, and may be dramatic in terms of increased learning and performance. In a similar vein, Darling-Hammond and Synder in [26] (2000) suggested that reducing class size might boost learning and that having proper research tools and instructional materials could improve students' performance greatly.

Fraser and Killen in [27] investigated the factors affecting first-year and senior university students' academic performance, comparing the attitudes of lecturers and students toward education. The findings suggest the need for supportive learning environments and strategies to enhance student success. Ogbogu in [28] studied the factors influencing the academic achievement of Public Administration students at a Nigerian Institution. Purposive sampling was used to choose 131 final-year students for the study. Questionnaires were used to collect data, which was then analysed using factor analysis, Pearson's correlation, and simple percentages. According to the findings, just 53% of the students fared above average, with a CGPA of 3.0. The study discovered, however, that the institutional issues studied, such as adverse learning circumstances, a poorly stocked library, and intermittent water supply, had no significant influence on student performance.

Nwosu *et al.* in [29] conducted the determinants of underachievement among student instructors at a Nigerian University. The study used qualitative methods to involve 30 student teachers from the English/Education option. The findings revealed that school-related factors have an important impact on academic achievements. The review emphasised the importance of considering external factors beyond students' intellectual abilities when understanding academic underachievement. Mekuria and Teketel in [30] conducted a study at Agarfa Secondary School in Ethiopia to explore the factors affecting students' achievement in Mathematics. The review established that school factors and management-related factors had impacted students' Mathematics achievement. Emilio in [31] studied the elements affecting junior high school pupils' social studies performance. 310 students were chosen as the sample size for a descriptive survey using stratified random sampling. Means and standard deviations were used to examine the data gathered through surveys. The study identified school-related factors (classroom atmosphere, teaching materials, supervision, and class size) as influential factors in academic performance.

These studies demonstrate that factors such as teaching methods, time management, student attendance, learning techniques, family support, socioeconomic factors, and personal attributes can impact academic performance in various educational contexts. Understanding these factors can inform strategies to improve academic outcomes for students, educators, policymakers, and researchers. Other authors in [32] - [34] have also considered various factors affecting mathematics education. In this study however, the authors assessed factors affecting students' performance in Mathematics at Landmark University.

Mathematics is an essential subject in education systems worldwide, providing students with critical thinking, problem-solving, and analytical skills. However, student performance in Mathematics has been a cause for concern in many educational institutions, including Landmark University. Understanding the factors that influence students' performance in Mathematics is crucial for educators and policymakers to design effective strategies and interventions to enhance Mathematics education. Landmark University, an esteemed academic institution, recognises the importance of Mathematics education and aims to provide a conducive environment for effective teaching and learning. While the University has invested significant resources in curriculum development, instructional materials, and quality faculty, a significant number of students continue to struggle with Mathematics, leading to substandard academic outcomes and limited opportunities in their future careers. Therefore, it is imperative to identify and evaluate the factors that contribute to this issue to develop targeted approaches for improvement.

Several factors have been found to influence students' performance in Mathematics, including socio-economical background, student characteristics, teaching methodologies, curriculum design, and socio-environmental factors. However, the specific context of Landmark University necessitates a case study to identify the unique factors that may contribute to students' performance in Mathematics.

Some factors which are assumed to be three-fold factors are as follows:

1. Student-related problems.
2. Teachers-related problems; and
3. System-related problem. By system problem, we refer to the educational institution, the curriculum, and the facility provided among other factors.

Ajewole *et. al.* citing [35] identified some of the student-related problems as follows:

- Poor study habits.
- Low self-concept.
- Overdependence on textbooks.
- Misconception.
- Poor performance on school-based examinations.
- Difficulty of the nature of the subject matter.
- Low enrolment of students.
- Preference for wealth generation.

Ajewole *et. al.* citing [36] identified some of the teacher-related problems as follows:

- lack of proper skills/workshop practice.
- classroom management and control.
- mastery of subject matter.
- teaching large classes.
- skipping difficult topics.
- poor teacher-student interaction.
- poor preparedness of teachers.
- lack of motivation of the teachers.
- attitude to work/lack of commitment.
- teaching towards examination.

2.0 METHODOLOGY

This study is therefore aimed at conducting an in-depth exploration of the factors influencing student performance in Mathematics at Landmark University. By focusing on this specific institution, the study can provide valuable insight into the educational context and shed light on the factors that may be crucial for understanding and improving student performance in Mathematics.

The study employed a mixed-methods approach, combining quantitative data analysis and qualitative inquiry. Quantitative data was collected through surveys (as assessments) capturing information about

students' academic background, attitudes towards Mathematics, self-perception, and instructional methodologies employed by lecturers.

By conducting this study at Landmark University, findings will be specific to the institution and its unique context, providing valuable insights for educational stakeholders. The research outcome will contribute to the existing body of knowledge on factors influencing student performance and aid in identifying to tailor its Mathematics education strategies to meet the needs of its students effectively.

Overall, this study seeks to bridge the gap in knowledge regarding the factors affecting student performance in Mathematics at Landmark University and provide practical recommendations to promote a positive learning environment and academic success in this critical subject.

Students' performance in Mathematics at Universities is important considering the significant of mathematics in science, engineering and other field of endeavours. To this end, an investigation of the factors influencing their academic achievement in this subject is necessary. The outcome of the finding will help in addressing any issue of concerns on students' performance and improve the study of Mathematics as course. The current study thus aimed at identifying and examining the specific factors that contribute to poor performance among University students.

A good number of students have had to re-sit or retake Mathematics courses because of one factor or the other. See [9], [12], [19], [20] and [28] for details.

Considering this as a major motivation, this research work intends to carry out this study to unveil those factors that have contributed to the non-effective academic performance of students in Mathematics at Landmark University, Omu-Aran, Kwara State, Nigeria. This study will not be limited to the students of Mathematics alone but as well as to other students that offer and apply Mathematics in one way or the other.

The study aims to determine the factors that affect students' performance in Mathematics at Landmark University, Omu-Aran, Kwara State, Nigeria. The objectives of the work are to:

- i. determine how teachers' methods affect students' academic performance in Mathematics,
- ii. investigate the nature of teacher-student interaction at Landmark University in Mathematics,
- iii. find out how students' interest can affect their performance in Mathematics,
- iv. determine the influence of students' background in Mathematics on academic performance,
- v. investigate how the learning environment affects students' performance in Mathematics.

2.1 Research Questions

The following research questions will serve as a guide to the study:

- i. How does the teaching method employed by teachers affect students' academic performance in Mathematics?
- ii. What is the nature of student-teacher interaction in Mathematics at Landmark University and how does it impact students' performance in Mathematics?
- iii. To what extent does students' interest in Mathematics influence their performance in Mathematics?
- iv. How does a student's background in Mathematics, including prior knowledge and educational experience, affect their academic performance in Mathematics?
- v. What is the relationship between the learning environment in Mathematics classrooms and students' performance in Mathematics?

In line with the University's quest for quality education and the sole goal of Landmark University SDG 4 (Quality Education Research Group). This study was carried out to determine factors that influence students' performance in Mathematics using Landmark University, Nigeria as a case study. The findings will provide valuable insights into the specific factors that collectively impact students' academic achievement in Mathematics. The identification of these factors will enable Landmark University to develop targeted interventions and strategies to enhance mathematical education.

Additionally, this study has a broader implication for the field of Mathematics education. The research outcome can contribute to the advancement of pedagogical practices and informs evidence-based decision-making not only at Landmark University but also in other educational institutions.

The findings of this study will also benefit the teachers as it will provide them with a sense of direction to help them to better understand their students and improve their relationship with them.

In summary, this study's significance lies in its potential to improve Mathematics education by identifying the factors influencing students' performance at Landmark University.

3.0 DISCUSSIONS OF RESULT

This section presents the result of the analyses as well as the discussion based on the data collected which analyses the factors affecting students' performance in mathematics which are categorised as *descriptive analysis*:

3.1 College

The result revealed that 57.1% of the students are from the College of Pure and Applied Science (CPAS) and 42.9% of the students are from the College of Engineering (COE). The mean (5.46) and standard deviation (.496) for the colleges.

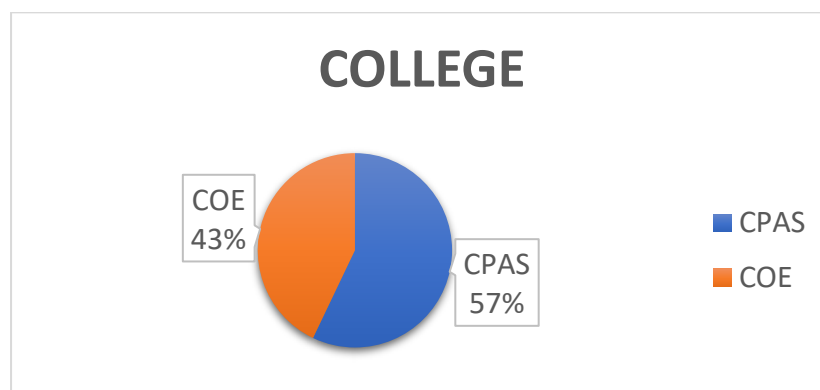


Figure 3.1: Result of students categorised by colleges.

A. Level

The result shows that students from 100-level have the highest percentage of 96.3% and 300-level students have the lowest percentage of 0.4%. The mean (1.08) and standard deviation (.459) for the levels.

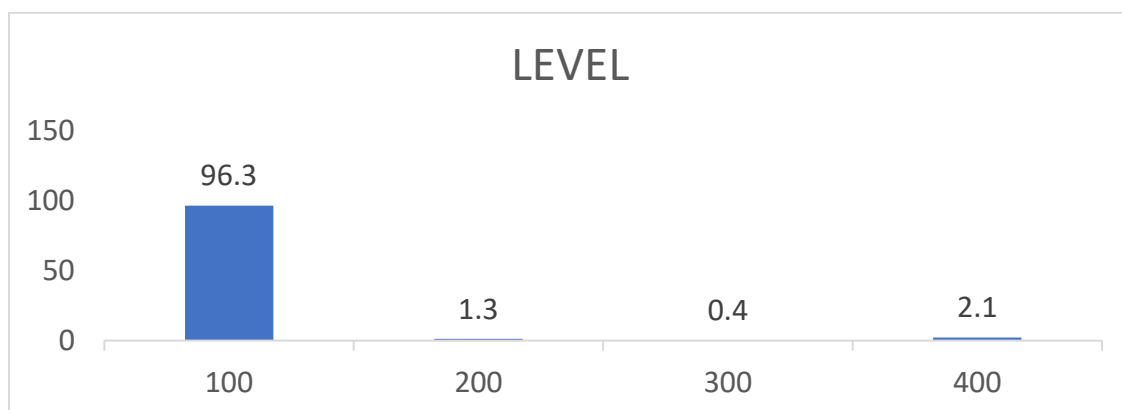


Figure 3.2: The result of students categorised by levels.

B. Department

The result indicated that the highest percentage of students 49.8% are from Computer Science department and the lowest percentage of students 0.4% are from Agricultural and Biosystem Engineering department. The mean (4.41) and standard deviation (3.400) for the departments.

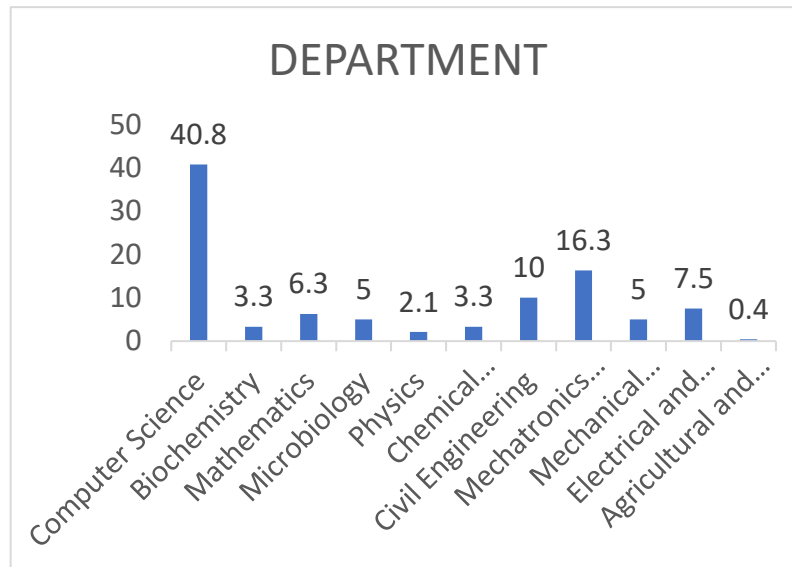


Figure 3.3: The result of students in the department category.

C. Age

According to the result, 93.8% is for students under the age of 15-19 and 6.3% is for students under the age of 20-25. The mean (1.06) and standard deviation (.243) are for the age.

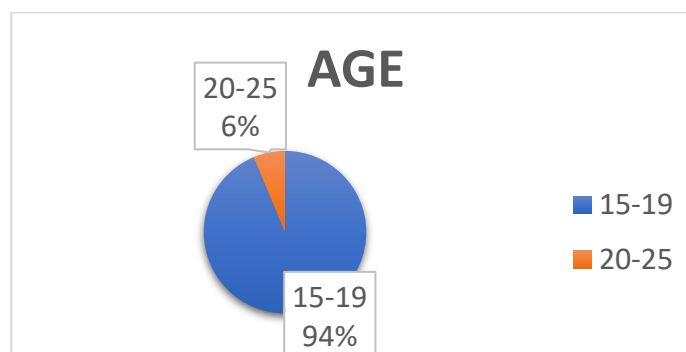


Figure 3.4: The result of students categorised by age.

D. Gender

According to the result, Male gender is 71.3% of the student while 28.7% is the Female gender. The mean (3.29) and standard deviation (.454) are for the genders.

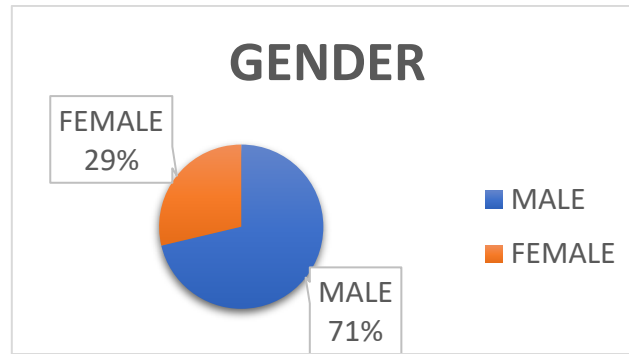


Figure 3.5: Result for the gender category.

E. Cross tabulation of College with Gender and Age

The number of male and female students in the College of Pure and applied science (CPAS) and the College of Engineering (COE) are presented in the table below and same for the age.

Table3.1: Crosstabulation of college with gender and age

	Gender		Age	
	Male	Female	15-19	20-25
College CPAS	84	53	127	10
COE	87	16	98	5
Total	171	69	225	15

F. Student-related factors

In the table below, student-related factors influence student performance. It is seen that student lack of interest, their lack of motivation, and their punctuality influence student performance while students' view of the course and their background doesn't affect students' performance.

Table 3.2: Student-related questions response

This is an open access article which permits use, distribution and reproduction in any medium, provided the original work is properly cited. © 2024 The Authors.

	N	SA	A	D	SD	Mean	Std. Deviation	Remark
Mathematics is a difficult course for me	240	8	42	130	60	2.99	.749	Disagreed
I do not have interest in mathematics	240	5	19	119	97	4.28	.699	Agreed
My background in Mathematics is weak	240	12	46	107	75	2.98	.841	Disagreed
I am not motivated to attend Mathematics classes	240	8	28	116	88	4.18	.765	Agreed
I am always punctual to my Mathematics classes	240	83	129	25	3	4.22	.675	Agreed

G. Teachers-related factors

It is seen that teacher-related factors influenced student performance by the variables in the table below. In contrast to how teacher teaching methods don't affect students' performance, it is clear that teachers' accessibility, their time usage, their interaction with students, and their punctuality have an impact on student's performance.

Table 3.3: Teacher-related questions response

	N	SA	A	D	SD	Mean	Std. Deviation	Remark
I always have problems with my mathematics teachers' teaching methods	240	23	77	123	17	3.44	.763	Disagreed
Most teachers are not easily accessed	240	20	95	106	19	3.52	.760	Agreed
Teachers effectively use time during class periods	240	55	158	22	5	4.10	.630	Agreed
My teachers give room for questions during teaching	240	69	147	22	2	4.18	.618	Agreed
Teachers are punctual to their classes	240	54	158	27	1	4.10	.587	Agreed

G. System-related factors

The variables in the table below show how System-related factors affected student achievement. The learning environment, good library, and facilitated classrooms have an impact on student performance. In the same vein, students access to internet and power supply shows no impact on their performance.

Table 3.4: System-related questions response

	N	SA	A	D	SD	Mean	Std. Deviation	Remark
Landmark University has a very good learning environment	240	65	141	24	10	4.09	.729	Accepted
We have good access to materials and textbooks in the University's library	240	73	153	9	5	4.22	.613	Accepted
All our classrooms have smart boards to facilitate teaching and learning	240	90	130	18	2	4.28	.636	Accepted
We have good access to internet connection	240	22	50	91	77	3.07	.946	Disagreed
We have uninterrupted power supply	240	12	38	107	83	2.91	.836	Disagreed

H. Correlation

Correlation of MAT111 and MAT112

Table 3.5: The correlation between MAT111 and MAT112

		2019_2020		2020_2021		2021_2022	
		MAT111	MAT112	MAT111	MAT112	MAT111	MAT112
MAT111	Pearson Correlation	1	.900**	1	.959**	1	.948**
	Sig. (2-tailed)		.000		.000		.000
	N	486	486	442	442	373	373
MAT112	Pearson Correlation	.900**	1	.959**	1	.948**	1
	Sig. (2-tailed)	.000		.000		.000	
	N	486	486	442	442	373	373

This is an open access article which permits use, distribution and reproduction in any medium, provided the original work is properly cited. © 2024 The Authors.

From the above table, there is a mass positive association between MAT111 and MAT112 in the year (2019/2020) with a correlation value (0.900) which is statistically significant with p-value of $0.000 < 0.1$ level of significance. Furthermore, the association between MAT111 and MAT112 in the years 2020/2021 and 2021/2022 indicates a positive association with correlation values of 0.959 and 0.948 respectively. This also shows a statistical significance with the same p-values $0.000 < 0.1$ at a 1% level of significance.

Correlation of MAT121 and MAT122

Table 3.6: The correlation between MAT121 and MAT122

		2019_2020		2020_2021		2021_2022	
		MAT12 1	MAT12 2	MAT121	MAT122	MAT121	MAT 122
MAT12 1	Pearson	1	.898**	1	.966**	1	.951*
	Correlation						*
	Sig. (2-tailed)		.000		.000		.000
N		466	466	431	431	370	370
MAT12 2	Pearson	.898**	1	.966**	1	.951**	1
	Correlation						
	Sig. (2-tailed)	.000		.000		.000	
N		466	466	431	431	370	370

In the above table, the association between MAT121 and MAT122 in the year 2019/2020 indicates a positive association with the correlation value (0.898). This also shows a statistical significance with the same p-values $0.000 < 0.1$ at a 1% level of significance. Furthermore, there is a mass positive association between MAT111 and MAT112 in the year 2020/2021 and 2021/2022 with correlation values of 0.966 and 0.951 respectively, which is statistically significant with the same p-value of $0.000 < 0.1$ level of significance.

L. Correlation of MAT212 and MAT222

Table 3.7: The correlation between MAT212 and MAT222

		2019_2020		2021_2022	
		MAT212	MAT222	MA212	MAT222
MAT212	Pearson	1	.493**	1	.843**
	Correlation				
	Sig. (2-tailed)				
N		110	110	169	169
MAT222	Pearson	.493**	1	.843**	1
	Correlation				
	Sig. (2-tailed)				
N		110	110	169	169

With a correlation value of (0.493), the link between MAT212 and MAT222 in the 2019/2020 academic year suggests a positive association. A substantial positive link between MAT212 and MAT222 is also present in the years 2021/2022, with correlation coefficients of 0.843. This association is statistically significant with the p-values of $0.000 < 0.1$ at a 1% level of significance.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The study concludes that student-related factors, teacher-related factors, and system-related factors have a significant impact on students' performance in mathematics at Landmark University. Student interest, teacher-student relationship, motivation, punctuality, effective teaching method, teacher accessibility, good learning environment, and facilitated classroom are the characteristics under the selected factors and they are crucial in improving students' mathematics performance. Also, the correlation between some selected courses showed that there is a positive association between their performances.

4.2 Recommendations

It is essential for educators and policymakers to address these factors and develop strategies to enhance mathematics education at the university. On the findings, several recommendations are proposed to improve students' performance in Mathematics at Landmark University. Firstly, faculty members should be punctual to their classes, they should be easily accessible for questions or assistance after teaching hours, and employ innovative teaching methods that promote active learning and student participation in mathematics classes. Secondly, students should be encouraged to develop interest in mathematics, be motivated to attend their classes, and be punctual to their classes to improve their performance in mathematics. Finally, the university should set up enjoyable support programs and initiatives to increase student motivation and interest in mathematics. Additionally, the university should set up a good learning environment by setting up a good and equipped library and creating a standard learning classroom.

Implementing these recommendations will contribute to the improvement of students' performance in mathematics at Landmark University. Mathematics has enormous applications in diverse fields of human endeavours such as science, engineering, computer science, economics, accounting, agriculture among others and its knowledge cannot be over emphasized. This is why the knowledge of mathematics at this level is very important [37] – [39].

ACKNOWLEDGEMENT

The authors would like to acknowledge Landmark University, Omu-Aran, Nigeria, <https://lmu.edu.ng>.

REFERENCES

- [1] M. Y. Tukur, N. Abimbola & G. Adeshina (2013). Factors Influencing Effective Learning of Mathematics at Senior Secondary Schools within Gombe Metropolis, Gombe State Nigeria, *Journal of Education and Practice*; 4 (25): 61 – 66.
- [2] M.O. Odumosu, M.O. Oluwayemi & T.O. Olatunde, Mathematics as a tool in Technological acquisition and Economic Development in transforming Nigeria to attain vision 20; 20; 20 *A proceeding of Mathematical Association of Nigeria (MAN) Annual National Conference*, 2012; 199 – 207.
- [3] S. Demir, Teacher perceptions of classroom management and problematic behaviors in primary schools. *Procedia Social and Behavioral Sciences*, 2009;1: 584 – 589.
- [4] B.S. Taştan, M.M.S. Davoudi, R.A. Masalimova, S.A. Bersanov, A.R. Kurbanov, V.A. Boiarchuk, and A.A. Pavlushin, The Impacts of Teacher's Efficacy and Motivation on Student's Academic Achievement in Science Education among Secondary and High School Students. *Journal of Mathematics, Science and Technology Education*, 2018; 14(6): 2353 – 2366.
- [5] S. T. Hijazi & S.M. Naqvi, Factors affecting students' performance: A case of private colleges. *Bangladesh E-Journal of Sociology*, 2006; 3 (1): 65 – 99.
- [6] Khezrimotlagh Factors Affecting First-Year Undergraduate Students' Academic Performance 2015.
- [7] W.M. Rosemary, Antecedent Factors Affecting Academic Performance of Graduate Students at the Nairobi Evangelical Graduate School of Theology. *Journal of Education and Practice*, 2016; 7(18).
- [8] A. Ali, L. Soosan and A.Hamze,, The Effect of Teaching Strategy Based on Multiple Intelligences on Students' Academic Achievement in Science Course. *Universal Journal of Educational Research*, 1(4), 281 – 284.
- [9] N. Harb, and A. El-Shaarawi, Factors Affecting Students' Performance. *Munich Personal RePEc Archive*, 2006; 126(4): 760 – 766.
- [10] S. Naqvi, Factors Affecting Students' Performance: A Case of Private Colleges. *Education*, 2006; 126(4): 808 – 815.
- [11] L. Steenkamp, R. Baard., and B.L. Frick, Factors influencing success in first-year accounting at a South African university: A comparison between lecturers' assumptions and students' perceptions. *South African Journal of Accounting Research*, 2009; 23(1): 27 – 42.
- [12] S.A. Abbasi, and M.G. Mir, Impact of Teacher's Ability, Student's Work Ethics and Institutional Environment on Student Performance of University of Gujrat. *Middle-East Journal of Scientific Research*, 2012; 12(4): 572 – 579.
- [13] S. Ali, Z. Haider, A. Ahmed, A., Factors Contributing to the Student's Academic Performance: A Case Study of Islamia University Sub-Campus. *American Journal of Educational Research*, 2013; 1(8): 283 – 289.
- [14] M.M. Alam, M.A. Billah, and M.S. Alam, Factors Affecting Academic Performance of Undergraduate Students at International Islamic University Chittagong (IIUC), Bangladesh. *Journal of Education and Practice*, 2014; 5(39): 49 – 58.
- [15] H. Reda, and G. Mulugeta, Investigating the Causes of Students' Less Academic Performance in Engineering College of Debre Berhan University. *American Journal of Theoretical and Applied Statistics*, 2018; 7(3): 126 – 131.
- [16] E. Peteros, A. Gamboa, J.O. Etcuban, A. Dinauanao, R. Sitoy, and R. Arcadio, Factors Affecting Mathematics Performance of Junior High School Students. *International Electronic Journal of Mathematics Education*, 2020; 15(1):
- [17] M.S. Jony, Exploring the Key Factors Influencing the Academic Performance of First Year Students at Undergraduate Level in Bangladesh. *Journal of Educational Issues*, 2021; 7(2): 288.
- [18] P. Chand, and H. Sharma, Factors Affecting Academic Performance of Senior Secondary Science Students: An Exploratory Study in Himachal Pradesh. *Education*, 2012; 133(2): 278 – 288.
- [19] O.A. Hassana, Factors Affecting Students' Academic Performance in Mathematical Sciences Department in Tertiary Institutions in Nigeria. *US-China Education Review*, 2013; 3(12): 905 – 913.

- [20] A.M Adeyemi, and S.B. Adeyemi, Institutional Factors as Predictors of Students' Academic Achievement in Colleges of Education in South Western Nigeria. *International Journal of Educational Administration and Policy Studies*, 2014; 6(10): 197 – 207.
- [21] T.O. Ayodele, T.T. Oladokun, and J.T. Gbadegesin, Factors influencing academic performance of real estate students in Nigeria. *Property Management*, 2016; 34(5): 352 – 367.
- [22] Abdelnaser, O., & Mohamed, S. H. S. (2019). Factors Affecting the Academic Performance of Students at Academic Institution. *IJRRAS*, 40(1).
- [23] Y. Eratl Şirin and M. Şahin, Investigation of Factors Affecting the Achievement of University Students with Logistic Regression Analysis: School of Physical Education and Sports Example. *SAGE Open*, 2020; 1 – 9.
- [24] L. Aye bale, G. Habaasa, and S. Tweheyo, Factors affecting students' achievement in mathematics in secondary schools in developing countries: A rapid systematic review. *Statistical Journal of the IAOS*, 2020; 36: 573 – 576.
- [25] S. Devadoss, and J. Foltz, Evaluation of Factors Influencing Student's Class Attendance and Performance. *American Journal of Agricultural Economics*, 1996; 78(3), 499 – 507.
- [26] L. Darling-Hammond, and J. Snyder, Authentic Assessment of Teaching in Context. *Teaching and Teacher Education*, 2000; 16(5-6): 523 – 545.
- [27] W.J. Fraser, and R. Killen, Factors influencing academic success or failure of first-year and senior university students: Do education students and lecturers perceive things differently? *South African Journal of Education*, 2003; 23(4): 254 – 260.
- [28] C.O. Ogbogu, Institutional Factors Affecting their Academic Performance of Public Administration Students in a Nigerian University. *Public Administration Research*, 2014; 3(2).
- [29] K.C. Nwosu, C.C. Okoye, and U.H. Onah, An Interpretive Descriptive Study of Factors Affecting Academic Achievement of Underachieving Student Teachers in Nigeria. *Journal of At-Risk Issues*, 2018; 21(1): 75 – 90.
- [30] Y. Mekuria, and M. Teketel, Factor Affecting Student's Achievement in Mathematics: The Case of Agarfa Secondary School, Ethiopia. *Education Journal*, 2019; 8(6): 307 – 319.
- [31] D.K. Emilio, Factors Influencing the Performance of Junior High School Students in Social Studies in the Bia East District of Ghana. *Journal of Education and Practice*, 2020; 11(20): 30.
- [32] G.A. Ajewole, S.O. Saibu, and W. Osunloye, A critical assessment of the problems and challenges of Science, Technology and Mathematics Education in Nigeria, *Journal of Science and Movement Education (JOSEM)*, 2013; 7: 1 – 11.
- [33] B. Mijares Factors Affecting the Academic Performance of Learners in Mathematics Amidst Pandemic, 2022.
- [34] T.T. Wijaya, B. Yu, F. Xu, Z. Yuan, and M. Mailizar, Analysis of Factors Affecting Academic Performance of Mathematics Education Doctoral Students: A Structural Equation Modeling Approach. *International Journal of Environmental Research and Public Health*, 2023; 20(5): 4518.
- [35] P. Okebukola, Old, new, and current technology in education. *UNESCO Africa*, 1997; 14(15): 7 – 18.
- [36] P.A. Okebukola, Quality assurance in the Nigerian university system. *Nigerian Journal of Curriculum Studies*, 2005; 12(3): 1 – 5.
- [37] Aladeitan B, Lukman AF, Davids E, Oranye E.H, Kibria GBM. Unbiased K-L estimator for the linear regression model. *F1000Res*. 2021 Aug 19;10:832. doi: 10.12688/f1000research.54990.1. PMID: 35186270; PMCID: PMC8825663.
- [38] Lukman A. F., Oluwayemi M. O., Okoro J. O. and Onate C. A. (2019). The impact of population growth and economic growth on carbon emission in Nigeria, *Iranian Economic Review*, **23**(3), 715-731.
- [39] Oyedepo T., Ayoade A. A., Oluwayemi M. O., Pandurangan R. (2023). Solution of Volterra-Fredholm Integro-Differential Equations Using the Chebyshev Computational Approach, *2023 International Conference on Science, Engineering and Business for Sustainable Development Goals (SEB-SDG)*, Omu-Aran, Nigeria, 2023, pp. 1-6, <https://doi.org/10.1109/seb-sdg57117.2023.10124647>.