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# Predictive Validity of First Year Cumulative GPA over the Final Cumulative GPA of Basic Education Graduates

Hassan Mubarik Iddrisu and Simon Alhassan Iddrisu
University for Development Studies P.O Box TL1350 Tamale, Ghana

## ABSTRACT

This study investigated the predictive validity of first-year Cumulative Grade Point Average (CGPA) over final-year CGPA for graduates of Basic Education at the University for Development Studies. The study aimed to investigate the extent to which early academic performance can accurately predict students' success in their final year. Academic data of Basic Education graduates covering three academic years (2014/15, 2015/16 and 2016/17) were collected and used to conduct correlational analysis. The results revealed a positive strong and significant correlation ($r = 0.918$, $p = 0.000$) between first-year CGPA and final-year CGPA. Students who excelled academically in their first year tend to maintain similar levels of performance in their final year. Regression analysis again confirmed the predictive power of the first-year CGPA, accounting for approximately 84.2% of the variance in final-year CGPA. Gender was found to have a very weak and non-significant correlation ($r = -0.030$, $p = 0.625$) with final-year CGPA, indicating that gender does not significantly influence academic performance in the Basic Education programme. The findings hold practical implications for educational institutions, suggesting that first-year CGPA can be utilized to identify at-risk students and implement tailored support plans to encourage success and continuous growth. This research contributes valuable insights to the field of education assessment and student evaluation, emphasizing the importance of establishing a strong academic foundation in the first year to ensure successful academic outcomes in the final year.

**Key words:** predictive validity, validity coefficient, predictor, criterion, predictive power, grade point average, basic education, academic performance

## INTRODUCTION

The idea of testing is one of the most significant contributions the discipline of psychology has made to society (Kline, 2013). When utilized effectively, well-created examinations offer useful data for decision-makers in academic, professional, and therapeutic contexts. Testing is a part of assessment, which is a generic phrase. The usual method of gauging academic progress is through testing. Information is gathered in relation to an established purpose or objective through testing, which is both a process and an instrument (Shute & Zapata-Rivera, 2010). A well-designed exam should not only test factual knowledge but also evaluate the students' ability to apply concepts, analyse information, and think critically. There are many uses of test as it can be applied to various facets of life. According to Kane (2013), among the most important justifications for creating and designing tests in general are the applications and uses of the tests.

Most educators assume that tests in schools are solely used to evaluate pupils and give them grades. Often, when teachers want to know students' level of understanding of a taught content or when evaluators want to measure the mastery of an act, programme or for professional certification, tests are administered and grades assigned (Williamson & Herbert, 2004). The wide use of standardized tests and assessments in education can be attributed to their often-demonstrated utility (Fremer & Wall, 2003). Designing effective examinations is a

crucial aspect of a teacher's role in assessing students' understanding of a subject and their critical thinking skills.

According to Lent et al. (2019), conflicting opinions and reasons have been put forward by researchers to the usage of standardized tests in the admissions process, including its continual use or removal. Those opposing the usage of standardized test as a sole criterion for college admissions point out that, there is a biased effect of the test on Hispanic and African Americans thereby making it not fit as an admission criterion (Powell & Arriola, 2010).

The earliest known attempt to estimate college GPA was made by Theodore Sarbin in 1939, who compared predictions based on counsellor opinion with predictions of first-quarter college grades obtained through regression analysis. Since then, several studies have sought to use high school performance and admissions test scores to statistically predict college grades (Zwick, 2013). The majority of candidates are accepted and rejected by universities and colleges worldwide mostly based on evaluations of their senior high school grades and SAT and ACT scores, as these tests have exhibited the ability to help institutions in making predictions about how students would fare in their college courses.

Many countries in the world depend on the scores of standardized tests as an admission criterion into colleges and universities, of which Ghana is not an exception. In the Ghanaian educational system, progression from Senior High School to a tertiary institution demands a pass in the West Africa Senior Secondary Certificate Examination (WASSCE) which is carried out by the West African Examination Council (WAEC). The use of WASSCE results serves as a balanced yardstick for admitting students into higher educational institutions because there is a constant rise in demand for higher education. But the assumption that the grades in WASSCE are the only criterion for admission could be erroneous and is not fair to students from different grades or classes of schools (Gambo et al., 2021). Therefore, to create equitable admissions procedures, it is essential to develop models that are mindful of the various kinds of intelligence and ability displayed by students from varied backgrounds.

Adeyemi (2006) examined the use of Basic Education Certificate Examination in predicting students' performance in the SSCE, using a sample of 206 schools in the study. It was revealed that there was no significant correlation between student performance on the BECE mathematics examination and the SSCE mathematics examination. Again, the study revealed that Student's performance in BECE integrated science did not have a significant relationship with their SSCE physics. From the concerns raised above that standardize test seems not to be good predictors of students' final performance and thus the outcomes of entrance requirements or selection tests may not always be good indicators of candidates' successful completion or performance on a programme. It will be very important to determine which variables are good predictors of students' performance.

The necessity to carefully examine candidates using a uniform or standard yardstick for everyone is essential as the demand for postsecondary education rises daily. Additionally, it must be guaranteed that those candidates who are picked may continue in and succeed in the programmes they have chosen. The practice of using students' current WASSCE results as a basis for predicting their future performance or final CGPAs in tertiary programmes is a common approach by many higher education institutions, including the University for Development Studies (UDS). This practice is based on the assumption that WASSCE results can serve as reasonable indicators of student's academic preparedness for university-level coursework.

A study by Al-Asmar et al. (2020) sought to explore the correlation between high school grade point average (HS-GPA) and academic accomplishment, as well as the contentment with careers among dental graduates in Jordan. The study encompassed dental students who were enrolled at the University of Jordan's School of Dentistry between 2010 and 2014. The findings revealed a slight positive association (0.30) between high school grade point average and

academic achievement among dental students. Additionally, the research indicated a negative correlation between academic achievement and career satisfaction among fresh dental graduates. The study thus provided insights into the relationship between HS-GPA, academic achievement, and career satisfaction among dental graduates. While HS-GPA correlated strongly with AA-GPA, the correlation between it and employment status was weak.

Another study conducted by Iddrisu, (2009) disclosed that, both the first-year CGPA and the final CGPAs for the whole school year showed substantial positive correlations with SHSCE grades. The most important finding was that SHS students' final year GPA was not accurately predicted by their entry grades (SHSCE grades). Similarly, Ali and Al-Hattami (2012) concluded in a study that high school GPA did not accurately predict the fourth-year cumulative GPA at the college, hence there is the need to further investigate the predictive ability of the first-year CGPA over the final-year cumulative GPA.

Considering the significance of a successfully completed university education, it is critical to ascertain if a student's first-year GPA is a reliable indicator or good predictor of future academic performance in universities in Ghana. And since there hasn't been a study done on B.Ed. Basic Education students at the Faculty of Education, University for Development Studies, the researcher decided to undertake the study there utilizing students' First year GPAs and their cumulative Final year GPAs.

This study therefore aimed to examine the predictive validity of first year CGPA over final year CGPA for three successive batches of Basic Education graduates at the Faculty of Education.

**Purpose of the Study**

This study's major objective was to investigate the relationship between the first year GPA of students enrolled in the Basic Education programme at the Faculty of Education, University for Development Studies, and their cumulative GPAs. The study specifically aimed to:

1. examine the GPAs of the Basic Education students in order to establish the relationship between their first-year cumulative grade point average (CGPA) and their final-year CGPA;
2. investigate the nature of the relationship between student's gender (male or female) and the final year cumulative GPA;
3. investigate whether first-year CGPA is a good predictor of final cumulative GPA at UDS. Thus, whether a high first-year CGPA necessarily predicts high class or high final cumulative GPA.

**Hypothesis**

1. There is no statistically significant relationship between the first-year CGPA and the final-year CGPA of Basic Education students at Faculty of Education.
2. There is no statistically significant relationship between a student's gender and the final-year CGPA for the three successive year B.Ed. Basic education students.
3. There is no significant predictive relationship between graduates' first-year CGPA and the final CGPA at Basic Education Department.

## LITERATURE REVIEW

Reliability assesses the consistency of assessments results given to the same people at various times as well as the comparability of collections of items from the same exam (Drost, 2011). The coefficient of reliability ranges from 0 to 1, where 1 corresponds to perfect reliability and 0 to no reliability. Correlation-based statistical tests are commonly applied to compute the reliability of test-retest and alternate forms (Kimberlin & Winterstein, 2008).

Although a high reliability coefficient may indicate that the test taker's score is reliable, but it does not ensure that the examiner's conclusions are valid. The outcomes are more accurate when the reliability coefficient is high, which enhances the likelihood that research decisions made will be wise ones.

The idea that a reliable measure is not always a valid measure might be a little perplexing to a beginning researcher. Shultz et al. (2020) defines reliability as the portion of a measure that is free from merely random error. Nothing in the definition of reliability calls for the measure to be valid. There is a chance that a highly reliable metric will be invalid (Drost, 2011). For an instrument to be considered valid, reliability is a required but insufficient precondition (Bajpai & Bajpai, 2014).

**Concept of Correlation**

Correlation analysis involves utilizing suitable statistical techniques to establish the degree of the association between two variables (Shivam, 2020). The analysis underlying the assumption is that the quantitative variables are connected in a linear form (or straight line) (Asuero et al., 2006). In every correlational study, a correlation analysis is performed with the basic objective of examining the association between independent and dependent variables. Two variables are said to be linearly related when high or low values on one measure tend to "go along" with high or low values on the other, respectively (Senthilnathan, 2019). The two statistical metrics most often used to quantify the relationship between variables are Spearman's Rank Correlation Coefficient and Pearson's Product Moment Correlation Coefficient. The study primarily focuses on usage of Pearson's Simple Linear Correlation to analyse the relationship between variables.

Fritz et al. (2012) opined that the purpose of the analysis is another important factor to consider when interpreting the correlation coefficient. As an illustration, if the analysis aims to make predictions relying on the interrelation between two variables, a higher correlation coefficient might be essential to establish a dependable predictor. Conversely, if the aim is to explore the relationship between variables in a descriptive or exploratory manner, a lower correlation coefficient may still be informative.

Once more, it's crucial to take into account the statistical significance of the correlation coefficient when interpreting its implications. A correlation coefficient that is statistically significant signifies that the connection between the two variables is improbable to be a result of chance. On the other hand, a non-significant correlation could still imply a relationship between the variables, though the level of certainty is reduced (Goodwin & Leech, 2006). Thus, the interpretation of a correlation coefficient depends on multiple factors, including the field in which the research is being conducted, the purpose of the analysis, and the statistical significance of the correlation coefficient. It is crucial to consider these factors when analysing the results of a correlation analysis (Fritz et al., 2012).

The correlation coefficient, represented as r, is a standardized indicator whose value is independent of the scales at which the variables are measured. The correlation coefficient is simply mathematically interpreted as a measurement of the strength of the linear relationship between any two variables (Patrick et al., 2018). Its values are between (-1, 1) all inclusive, where the values are absolute and nondimensional with no units involved and the squared value of the correlation coefficient signifies the extent to which the variability in one variable decrease while maintaining constant variability in the other (Asuero et al., 2006). A correlation coefficient of zero (0) indicates that there is no relationship between the measured variables. The correlation is stronger and suggests a strong linear relationship between the variables as the coefficient gets closer to ± 1, irrespective of the direction. How strong the relationship is, has nothing to do with the direction or the sign. Hence, the coefficients of the measured variables, r = 0.80 and r = -0.80, are equivalent in strength. If the variables have a positive

correlation coefficient, it means that they are directly related, with an increase in one variable causing an increase in the other. When two variables are correlated negatively, one variable rises while the other decreases. However, the two variables' connection is said to be uncorrelated or non-linear if $r = 0$ (Alexopoulos, 2010).

Some common guidelines suggest that correlations of 0.10 to 0.30 are considered weak, 0.31 to 0.50 are moderate, and above 0.50 are strong (Cohen et al., 2013). Reading a strong correlation between two variables as a cause-and-effect relationship is one of the most frequent and significant errors in correlation analysis. An association or link is measured via correlation analysis; the rationale or justification are not specified. Although statistics do not lie, they may cause us to draw erroneous inferences. Thus, care must be used when interpreting correlation coefficient to prevent this danger (Field, 2013).

**Concept of Regression**

Regression is a statistical technique for determining how an independent variable and a dependent variable are related (Fox, 2016). The independent variable is the one utilized to produce the prediction, whereas the dependent variable is the one being predicted or explained. In order to create predictions or to explain variation in the dependent variable, regression analysis aims to identify the direction and degree of the relationship between the independent variable(s) and the dependent variable(s) (Shi & Conrad, 2009).

Gordon (2015) opined that regression analysis comes in a variety of forms, such as basic linear regression, multiple linear, logistic, and nonlinear regressions. In a simple linear regression, a dependent variable is forecasted using a sole independent variable. Conversely, multiple linear regression involves employing multiple independent variables to predict a dependent variable. In logistic regression, a binary outcome—i.e., yes/no or 0/1—is predicted using one or more predictor variables. With nonlinear regression, a dependent variable is predicted using a nonlinear function of one or more independent variables.

**Grade Point Averages**

A Grade Point Average (GPA) is a standardized way of representing a student's academic performance over a specific period, usually a semester or an entire academic programme (Al-Asmar et al., 2020). A student's academic success is quantified by their grade point average (GPA). It is determined by giving letter grades achieved in each class a point value, then average those values to obtain the total GPA. GPA is used by educational organizations to assess student performance and provide guidance for improvement. GPA measures a student's academic performance and can be an important factor in college/university admissions and graduations, scholarship applications, and job applications (Felton & Koper, 2011).

The GPA scale and calculation method can vary depending on the institution. For example, the University for Development Studies (UDS) in Ghana uses a 5.0 grading scale, where grades of $A^+$, A, $B^+$, B, $C^+$, C, $D^+$ and D correspond to point values of 5.0, 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, and 1.5 respectively. At UDS, GPAs are calculated by multiplying the point value of each grade earned in a course by the number of credit hours for that course, adding up the products, and dividing the total by the total number of credit hours attempted (University for Development Studies, Grading Scale - Quoterich, 2020).

**Theoretical Framework**

The intellectual underpinning for the research question, hypotheses, and techniques is provided by the theoretical framework, which is a crucial part of every research project (Bazeley, 2020). Thus, the study is placed into a larger theoretical and empirical context with the aid of the theoretical framework, which also provides guidance for the data collection and interpretation. To investigate the link between the first-year CGPA and the final-year

cumulative GPA; the Academic Momentum Theory (AMT), and the Expectancy-Value Theory (EVT), were adopted as the theoretical frameworks.

***Academic Momentum Theory (AMT)***

The Academic Momentum Theory is a theory developed by Clifford Adelman. This theory posits that the initial academic performance of students can have a significant influence on their later academic success (Adelman, 2006). This theory as intimated by Adelman (2006) holds that students who make a great start in their academic endeavours are more likely to retain their momentum and enjoy better levels of academic success, whereas students who make a poor start are more likely to struggle and have lower levels of academic success.

For this study, academic achievement in the beginning (first-year GPA) can start a favourable feedback cycle that results in more success, as per the academic momentum theory. According to this study, first-year students who do well may develop study habits, drive, and self-assurance that help them succeed in following years. Students who have difficulty in their first year, on the other hand, may be more prone to encounter setbacks, uncertainty, and disengagement that may have a detrimental impact on their academic performance in subsequent years (Attewell et al., 2012; Kuncel et al., 2005).

***The Expectancy-Value Theory (EVT)***

Wigfield and Eccles (2000) intimated that, in the 1970s, social psychologist Martin Fishbein and his colleague Icek Ajzen created the expectancy-value theory. It is a theory of motivation that describes how people make decisions and selections based on their beliefs about their capacity to complete a task effectively and the importance they attach to the activity's results. The idea has been improved and updated throughout time by a number of scholars, including Wigfield and Eccles, who have highlighted the importance of both individual and environmental elements in determining students' expectations and value systems (Wigfield & Eccles, 2000).

Based on the Expectancy-Value Theory, a person's motivation and performance are impacted by their expectations about their own capacity for success and the importance they attach to the outcome (value) (Eccles & Wigfield, 2002). The Expectancy-value theory examines students' perceptions of their own academic prowess and the importance they attach to academic results might affect their drive, effort, and success in school. Research has validated the expectancy-value theory as a viable framework for analysing student motivation and academic accomplishment. For example, Hulleman et al. (2010) used interventions aimed at raising students' expectations for success and elevating their perceptions of the value of academic tasks led to better academic performance and perseverance. To predict the final year cumulative GPA for three consecutive years of Basic Education graduates using the first year GPA, the expectancy-value theory is a useful tool to understand how students' beliefs and attitudes toward academic achievement may affect their motivation and effort to perform well in their final year. As a result, it is anticipated that students who perform at a specific level in their first year would likely perform in a similar way in their final year, consistent with their earlier performance.

## METHODOLOGY

### Research Design

Kumar (2011) indicated that a research design is a methodical strategy used by researchers to provide valid, accurate, and objective response to research questions. The researcher wanted to examine the relationship between two variables, to make predictions based on the strength and direction of the correlation, and to address the research question of whether the first year CGPA is a good predictor of the final year CGPA. Therefore, a correlational research design was chosen for this study. Correlational research is a type of

research design that seeks to explore the relationship between two or more variables (Fraenkel et al., 2012). Correlational research has a straightforward basic design that focuses on examining how two or more variables relate to each other without manipulation, with the aim of understanding the nature and strength of their association across the entire range of values (Ary et al., 2006; Baum, 2021). There were three variables identified in this study, i.e., first-year CGPA, gender, and final-year CGPA. First-year CGPA and gender (male or female) were chosen as predictors (independent variables), and the student's final-year CGPA was selected as the criteria (outcome or dependent variable).

**Population**

This research focused on the target population, comprising all students admitted to the Basic Education programme at the Faculty of Education, University for Development Studies, during the specified period (2014 – 2016). Within this timeframe, a total of 263 Basic Education students were admitted. The accessible population for the study comprised students whose data were accessible and who were admitted to the Basic Education programme between 2014 and 2016.

**Sample and Sampling Techniques**

The Basic Education Studies Department provided the data and records of all students admitted to its B.Ed. Basic Education programme for the specified years. Data from the university's database was the only source of data used in the study. The three-year groupings were purposefully chosen so that the researcher could get three consecutive graduating batches from the department. Sampling was not necessary for this study as it followed a census-type research approach and as such, all students who were admitted into the Basic education programme from 2014 to 2016 was used for the study.

**Data Sources and Collection Tools**

Since the data was readily available in the university's database, there was no need to develop, or adapt an instrument for data collection. However, a format for data collection was developed to access the necessary portions of the student data. This format (Tabular) helped the researcher obtain data on the students' gender, first-year CGPA and the final-year CGPA for the three successive year students.

**Data Analysis**

Data acquired on the participating students was analysed using Statistical Package for Social Sciences (SPSS, version 25. The analysis was done in line with the research hypothesis posed for the study.

The data analysis in this study encompassed the bivariate correlations and regression analysis. Correlation coefficients were utilized as indicators for predictive validity, with the R-square values being employed as explanatory variables in the analysis. The intensity of the relationship between the independent and dependent variables was gauged through the Pearson Product-Moment correlation coefficient. Furthermore, the regression analysis yielded the prediction equation utilizing gender and the first-year GPA as predictor variables.

## RESULTS AND DISCUSSION

### Demographic Data

Two key demographic variables were examined: 'Entry Year' and 'Gender.' 'Entry Year' provided information about the distribution of students across different academic years within the Basic Education programme. On the other hand, 'Gender' offered insights into the gender composition of the sample, a factor that may have implications for academic achievement.

**Table 1: Distribution of Students by Entry Year**

| | | Frequency | Percent | Valid Percent |
|---|---|---|---|---|
| Valid | 2014/2015 | 87 | 33.1 | 33.1 |
| | 2015/2016 | 110 | 41.8 | 41.8 |
| | 2016/2017 | 66 | 25.1 | 25.1 |
| | Total | 263 | 100.0 | 100.0 |

**Table 2: Distribution of Students by Gender**

| | | Frequency | Percent | Valid Percent |
|---|---|---|---|---|
| Valid | Male | 167 | 63.5 | 63.5 |
| | Female | 96 | 36.5 | 36.5 |
| | Total | 263 | 100.0 | 100.0 |

The demographic data presented in Tables 1 and 2 offer valuable insights into the characteristics of the Basic Education graduate population under study. In Table 1, we examined the distribution of students across entry years. Notably, the majority of students (41.8%) graduated the programme during the 2015/2016 academic year, followed by 33.1% in 2014/2015 and 25.1% in 2016/2017. This data indicated fluctuations in enrolment over these three years, potentially reflecting changing trends in student interest or institutional factors affecting intake.

In Table 2, the researcher explored the gender distribution within the sample. It was clear that the majority of students were male, accounting for 63.5% of the total sample, while females make up the remaining 36.5%. This gender imbalance may warrant further investigation into how gender-related factors could potentially influence academic performance, particularly in the context of Basic Education.

### Relationship between First-Year and Final-Year CGPA

***Hypothesis 1***

The intent of the hypothesis was to investigate the potential relationship between the first-year Cumulative Grade Point Average (CGPA) and the final-year CGPA among Basic Education students at the Faculty of Education.

**$H_0$:** There is no significant relationship between the first-year CGPA and the final-year CGPA of Basic Education students at Faculty of Education. ($H_0$: $\mu_F = \mu_A$)

**$H_1$:** There is a significant relationship between the first-year CGPA and the final-year CGPA of Basic Education students at Faculty of Education. ($H_1$: $\mu_F \neq \mu_A$)

where μF is the population mean of first-year CGPA, and μA is the population mean of final-year CGPA.

These hypotheses were rigorously tested through statistical analysis to determine whether evidence supports the presence of a significant relationship.

**Table 3: Relationship between first-year CGPA and final-year CGPA**

| | | First year CGPA | Final year CGPA |
|---|---|---|---|
| First year CGPA | Pearson Correlation | 1 | 0.918** |
| | Sig. (2-tailed) | | 0.000 |
| | N | 263 | 263 |
| Final year CGPA | Pearson Correlation | 0.918** | 1 |
| | Sig. (2-tailed) | 0.000 | |
| | N | 263 | 263 |

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

Table 3 displays Pearson correlation coefficients between first-year CGPA and final-year CGPA for Basic Education students at the Faculty of Education. The correlation between first-year CGPA and final-year CGPA is 0.918 (p = 0.000). The sample size for both variables is 263. With hypothesis 1, the intention was to investigate the relationship between first-year CGPA and the final-year CGPA of Basic Education graduates at the University for Development Studies. From the results in Table 3, the analysis showed a strong and highly significant positive correlation (r = 0.918, p=0.000) between "First year CGPA" and "Final year CGPA" for the B.Ed. Basic Education graduates. This suggests that students tend to do better in their final year if they performed well in their first year, and vice versa.

The results align with Cliford Adelman's Academic Momentum Theory, which suggests that early academic success is a predictor of continued success and persistence in higher education (Adelman, 2006). This implies that positive academic experiences and achievements in the early stages of a student's college career can have a cumulative effect, leading to continued success in subsequent years. The results were also supported by Pelumi et al. (2018), Iddrisu (2009), Dauda et al. (2020) and Nurudeen et al. (2023) who revealed that the first year CGPA has a highly significant positive correlation with the final year CGPA.

**Gender's Impact on Final-Year CGPA**

In pursuit of understanding how gender relates to final-year CGPA among Basic Education graduates, the researcher formulated specific hypotheses to guide the analysis and rigorously test the association in question.

***Hypothesis 2***

**$H_0$:** There is no significant relationship between a student's gender and the final-year CGPA for the three successive year B.Ed. Basic education students. ($H_0$: $\mu_G = \mu_A$)

**$H_1$:** There is a significant relationship between a student's gender and the final-year CGPA for the three successive year B.Ed. Basic education students. ($H_1$: $\mu_G \neq \mu_A$)

The hypothesis is used to quantify the relationship between students' GPA and the sex or gender. It seeks to find out whether there is a statistically significant relationship between one's gender and the final CGPA so that recommendations could be made to inform policy and practice in the classrooms.

**Table 4: Relationship between a student's gender and the final year CGPA**

| | | Gender | Final year CGPA |
|---|---|---|---|
| Gender | Pearson Correlation | 1 | -.030 |
| | Sig. (2-tailed) | | .625 |
| | N | 263 | 263 |
| Final year CGPA | Pearson Correlation | -.030 | 1 |
| | Sig. (2-tailed) | .625 | |
| | N | 263 | 263 |

Based on the results in Table 4, a very weak negative correlation (r = -0.030) between "Gender" and "Final year CGPA" for the B.Ed. Basic Education graduates was observed. However, the correlation is not statistically significant (p = 0.625), which suggests that any observed relationship between gender and final year CGPA could be due to chance rather than a true relationship. Because of how weak the connection is, it only accounts for a tiny fraction (0.1%) of the variation in the final CGPA ratings. Thus, the gender of students has almost no relationship with the final-year CGPA. Given that the correlation is nearly zero (-0.030), there may not be much of a linear relationship between gender and final-year CGPA scores. This finding is consistent with other research findings, such as Suleiman and Anane (2022), Ebenuwa-Okoh (2010) and Iddrisu (2009), which also found no significant relationship between gender and the final year CGPA.

## Predictive Power of First-Year CGPA

***Hypothesis 3***

Academic institutions worldwide grapple with the challenge of enhancing student retention and improving graduation rates (Caruth, 2018). The intent behind this hypothesis was to explore the predictive validity of a student's initial academic performance, as reflected in their first-year CGPA, in forecasting their ultimate academic outcomes upon graduation.

**$H_0$:** There is no significant predictive relationship between graduates' first-year CGPA and the final CGPA at Basic Education Department.

**$H_1$:** There is a significant predictive relationship between graduates' first-year CGPA and the final CGPA at Basic Education Department.

**Table 5: Model Summary of Regression Analysis**

| | | | | | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .918[a] | .842 | .842 | .18185 | .842 | 1392.379 | 1 | 261 | .000 |

a. Predictors: (Constant), First year CGPA
b. Dependent Variable: Final year CGPA

From the Table, the Pearson correlation coefficients between first-year CGPA and final-year CGPA for Basic Education students at the Faculty of Education is 0.918 (p = 0.000). It represents a very high significant positive correlation between the two variables, demonstrating that an increase in the first-year CGPA of a student leads to a corresponding increase in his or her final-year CGPA and vice versa. The coefficient of determination (R Square) was 0.842. This value indicated that approximately 84.2% of the variance in the final-year CGPA can be accounted for by the first-year CGPA. In other words, the first-year CGPA was a powerful predictor that accounts for a large portion of the variability in the final CGPA scores among B.Ed. Basic Education graduates. These results are consistent with numerous prior research studies in education and related fields. Studies such as, Iddrisu (2009), Abdelfattah et al. (2022), Pelumi et al. (2018), Nurudeen et al. (2023) and Gayles (2012) which all reported that first-year performance (first year CGPA) is a significant predictor of overall academic success, including final-year performance.

However, it is crucial to remember that the remaining 15.67% of the variance in the final-year CGPA is not accounted for by the first-year CGPA. Other factors not considered in this analysis could also contribute to the final CGPA scores.

**Table 6: Regression Analysis Coefficients Output**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | T | Sig. |
| 1 | (Constant) | 0.834 | 0.079 | | 10.626 | 0.000 |
| | First year CGPA | 0.819 | .022 | 0.918 | 37.315 | 0.000 |

a. Dependent Variable: Final year CGPA

Table 6 presented the results of a regression model with the dependent variable as Final year CGPA. The unstandardized coefficients include the constant term (B = 0.834, Std. Error = 0.079, t = 10.626, Sig. = 0.000) and the coefficient for the predictor variable First year CGPA (B = 0.819, Std. Error = 0.022, Beta = 0.918, t = 37.315, Sig. = 0.000). The standardized coefficient (Beta) for First year CGPA is 0.918. The model is statistically significant (p = 0.000). With a constant term (intercept) of 0.834, the coefficient reported for the first-year CGPA was 0.819. This indicated that for every one-unit increase in the first-year CGPA, the final-year CGPA was expected to increase by 0.819 units.

**Prediction Equation**

Based on the first year CGPA and the final year CGPA, the prediction equation can be formulated as follows:

**Final-year CGPA = 0.834 + (0.819 * First-year CGPA).** This equation can be used to predict B.Ed. Basic Education student's final-year CGPA based on their first-year CGPA. For example, if a student's first-year CGPA is 3.5, the predicted final-year CGPA would be:

Final year CGPA = 0.834 + (0.819 * 3.5) = 0.834 + 2.8675 ≈ 3.7015**.** But it is worth noting that, regression equations provide estimated predictions, and actual CGPA scores may still vary due to other factors not included in the model (Changbao & Mary, 2020).

## CONCLUSION

The study found that students who performed well academically in their first year tended to maintain a similar level of performance in their final year, and vice versa. The strong and significant correlation between first-year CGPA and final-year CGPA highlights the importance of early academic performance in predicting long-term success. This information can be used by educational institutions to create policies and assistance programmes that recognize at-risk students before it is too late to offer them tailored interventions that will enhance their academic performance.

Furthermore, the regression analysis confirmed a strong predictive ability of the first-year CGPA, showing that it accounted for a substantial proportion (84.2%) of the variance in the final-year CGPA. Noting that the remaining 15.67% of the variance in the final-year CGPA is not accounted for by the first-year CGPA. Other factors not considered in this analysis could also contribute to the final CGPA scores.

Finally, the finding that gender exhibits a very weak and non-significant correlation with final-year CGPA in the B.Ed. Basic Education programme at the Faculty of Education, University for Development Studies, carries significant implications. It underscores the institution's commitment to providing equal educational opportunities for all students, regardless of gender. This result shifts the focus towards individual factors, such as motivation and study habits, as more influential determinants of academic performance. Resource allocation and support services can be directed more effectively by recognizing that gender may not be a significant predictor of success in this context. This finding also raises questions about the necessity of gender-specific interventions and affirmative action measures, prompting a broader discussion about equity in education policies and practices.

## RECOMMENDATIONS

A number of recommendations may be made to educational institutions, policymakers and stakeholders to enhance student performance and promote academic achievement based on the findings and conclusions.

1. It is recommended for the purpose of this study that Educational Institutions, especially the University for Development Studies' Faculty of Education should implement policies and support systems to identify at-risk students based on their first-year CGPA. Support systems such as providing sustained guidance and counselling services not only for the poor performing students, but also for the high performing students to maintain and even improve their performance. Proactive monitoring systems by designated lecturers trained for this purpose in this university.
2. The study again recommends that, the University for Development Studies and other educational institutions adopt inclusive approaches to academic support and avoid gender-based assumptions like the over concentration on the girl child and instead, provide equal assistance to all students.
3. The study recommends to Educational Institutions especially the Faculty of Education, at the University for Development Studies to strengthen the first-year orientation programmes with study skill workshops, and academic resources to ensure students have solid academic foundation and a smooth transition into university life.
4. This study further recommends that, educational institutions should continuously monitor and analyse academic data of students so as to utilize the insights gained from the study by incorporating interactive teaching methods such as discussions, group projects, and hands-on activities and structuring the curriculum to facilitate early academic success. Institutions such as the universities should institutionalise continuing professional development programmes for staff to equip them enough for these assignments.

## SUGGESTIONS FOR FURTHER RESEARCH

Despite the fact that the study achieved its stated objectives, there were still a number of related aspects that warranted additional research.

1. Since this research was limited in scope, further research is needed to extend the research to include other disciplines or programmes within the same institution or different universities.
2. Further research is needed to investigate the influence of non-cognitive factors such as motivation, self-regulation, study habits, and resilience on final-year CGPA.
3. Another area worth considering for study is the role of demographic factors (e.g., socioeconomic status, cultural background, and prior educational experiences) in predicting final-year CGPA.

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