

A MODEL OF FACTORS THAT INFLUENCE THE EFFECTIVENESS OF ENTREPRENEURSHIP EDUCATION IN GHANAIAN TECHNICAL UNIVERSITIES

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ABSTRACT

This paper seeks to examine the factors that influence the effectiveness of entrepreneurship education in Ghanaian Technical Universities. Five factors are considered to have influence on effectiveness of entrepreneurship education in this regard. These include Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness. At 0.05 level of significance, the study tested number of hypotheses using One-way ANOVA. This was reinforced by OLS regression model to examine the factors that influence effectiveness of entrepreneurship education in the Ghanaian Technical Universities. The findings of the study revealed that there was a significant difference in the extent to which Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness contributed to the effectiveness of entrepreneurship education in the Ghanaian Technical Universities. Human Resource Attractiveness contributed most to effectiveness of entrepreneurship education, whilst the least contribution was made by Government Support. These predictors account for 63.5% of variability in effectiveness of entrepreneurship education. The study recommends that government should enhance its support for entrepreneurship education to maximise the effectiveness of entrepreneurship education in Ghanaian Technical Universities and its contribution to job creation.

Keywords: Entrepreneurship, Entrepreneurship Education, Effectiveness, Technical Universities, Factors.

INTRODUCTION

Entrepreneurship is recognized as a basic practice of job creation on a global scale. As a result of the relevance of job creation in every economy, governments and academic institutions give priority to entrepreneurship education. Entrepreneurship is defined as a process of identifying and starting a business venture, sourcing and organizing the required resources and taking both the risks and rewards associated with the venture (Hart et al., 2010; Shane, 2003). From a personal standpoint, entrepreneurship involves pulling resources together to start a business in the face of risks whilst aiming to earn and maximize returns in the business.

The term “*entrepreneur*” was first used in 1723 and implies qualities of leadership, initiative and innovation in manufacturing, delivery, and services (Stuart & Des, 2000). Economist Robert Reich has called team-building, leadership and management ability essential

qualities for the entrepreneur (Hart et al., 2010). The entrepreneur is a factor in microeconomics, and the study of entrepreneurship reaches back to the work in the late 17th and early 18th centuries of Richard Cantillon & Adam Smith, which was foundational to classical economics (Stuart & Des, 2000). In the 20th century, entrepreneurship was studied by Joseph Schumpeter in the 1930s and other Austrian economists such as Carl Menger, Ludwig von Mises and Friedrich von Hayek (Osnabrugge & Robinson, 2000; Stuart & Des, 2000). The term "*entrepreneurship*" was coined around the 1920s (Osnabrugge & Robinson, 2000), and became something of a buzzword beginning about 2010, in the context of disputes which have erupted surrounding the wake of the Great Recession (Hart et al., 1997). Education has served as the medium of massive disputes and argument about the concept of entrepreneurship.

Entrepreneurship education has served a vital role in equipping people with the basic skills and competences for creating businesses. According to Lundstrom & Stevenson (2005), it is for the sake of the practicality of its education that entrepreneurship is mostly reserved to tertiary education in many sectors. Thus, education given to students on entrepreneurship is expected to help them set up businesses. This role of entrepreneurship in tertiary education is grossly underplayed (McMillan & Long, 1987; Veciana et al., 2005; Kuratko, 2005). Even in developed countries of the world such as Britain, Germany, United States of America and Italy, research has shown that entrepreneurship education is not serving its role effectively (Kuratko, 2005).

The situation is worse in Africa (Odra, 2012), and nations such as Nigeria, Ghana, Togo, South Africa and other west African countries are unable to make any significant value of entrepreneurship education (Honu & Gakpe, 2006; Gartner & Vesper, 1994). Entrepreneurship education is said to only serve as a formal aspect of education in African countries (Honu & Gakpe, 2006), without its ability to produce job creators (Peterman & Kennedy, 2003). In Ghana, the 2010 report of Ghana Statistical Service (GSS) indicates that unemployment among graduates is on the ascendancy. This situation has been attributed to the ineffectiveness of entrepreneurship education in Ghana (Trade Union Congress, 2013). Honu & Gakpe (2006) supported this by arguing that if there is gross unemployment among graduates then it is worth saying that entrepreneurship education is not working in many jurisdictions, including Ghana. Peterman & Kennedy (2003) shares in this same opinion.

In Ghana majority of graduates end up on the streets in search of unavailable jobs (GSS, 2010). Meanwhile, each of these graduates is given entrepreneurship education or the skills to create jobs. Basically, graduates are not able to utilize the entrepreneurship education that is granted them in establishing business or jobs to the benefit of others and themselves. This leads to the question: "*what causes this situation?*"

Peterman & Kennedy (2003) posited that people can only create jobs for themselves when entrepreneurship education is effective on them. They therefore insinuate that graduates are unable to create jobs because entrepreneurship education is not effective on them. Boyle (2001) found out in his research that the effectiveness of education is based on basic factors such as infrastructure of institution, adequacy of human resource, financial strength, support for government and willingness and readiness of students to be educated, and this is supported by the empirical works of Kuratko (2005) and Veciana et al., (2005).

Much is expected of Technical Universities in Ghana in terms of practical training of people to equip industry with the needed skills and competences. With respect to entrepreneurship education, Technical Universities still have the biggest role to play. Unfortunately, little is known about the contribution of Ghanaian Technical Universities to

entrepreneurship education. In view of that, this paper seeks to verify if effectiveness of entrepreneurship education is influenced by infrastructure of institution, adequacy of human resource, financial strength, and support for government, willingness, and readiness of students in Ghanaian Technical Universities. The study aims at evaluating the extent of contribution of Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness to the effectiveness of entrepreneurship education in Ghanaian Technical Universities. It will also assess the relationship between Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness and effectiveness of entrepreneurship education among Ghanaian Technical Universities.

LITERATURE REVIEW

At the theoretical level, entrepreneurship education is said to be critical for job creation and national development. Lundstrom & Stevenson (2005) theorized that entrepreneurship education is what enriches the economy with people capable of creating businesses and jobs. A suitable model on the effectiveness of entrepreneurship education has to do with the Theory of Business Process Effectiveness developed by McKainsey (1992). In his model, McKainsey (1992) argues that Infrastructure Adequacy, Human Resource Adequacy, Government Support and Financial Adequacy influence the effectiveness of a business process. The assumption underlying his model is that every venture that is aimed towards productivity is a business process. In this regard, education is regarded as a business process. Boyle (2001) carried out a research to test this model but had to add another factor, Student Readiness, to the list of factors on which McKainsey's (1992) theory is based. His new inclusion is based on personal experience; to him education cannot be effective and useful when students are not willing and ready to be educated. Students need to be psychologically ready to benefit from education. On this note, McKainsey's (1992) theory is tested in this paper in line with Boyle's (2001) findings.

In his research, Boyle (2001) found that effectiveness of education is influenced by infrastructure of institution, adequacy of human resource, financial strength, support for government and willingness and readiness of students to be educated. He used OLS regression to establish the relationship between the effectiveness of education and infrastructure of institution, adequacy of human resource, financial strength, support from government and willingness and readiness of students to be educated. In his OLS regression model, these factors (which were the predictors) contributed 58.5% of variability to effectiveness of education. Moreover, each of the predictors made a positive influence on effectiveness of education. In this regard, human resource sufficiency contributed the highest influence on the conditional mean of effectiveness of education. His model also indicated that government support made the least influence on effectiveness of education, and this was likely due to an insignificant level of government support for education.

Kuratko (2005) carried out a related research in which supporting findings were reached. The difference between the study of Boyle (2010) and Kuratko (2005) is that Boyle (2001) considered education in general whilst Kuratko (2005) focused on entrepreneurship education. The model of Kuratko (2005) accounted for 61.7% of variability in effectiveness of entrepreneurship education. Impressively, those of Veciana et al., (2005), who undertook the same investigation under the same set criterion variable and predictors, support the findings of Kuratko (2005). Meanwhile, Kuratko (2005) and Veciana et al., (2005) used the research of Boyle (2001) as a basis of investigation, since Boyle's (2001) study was based on the

effectiveness of education in general. The appropriateness of the study of Boyle (2001) in serving as a basis for related future research is reflected in his orientation of his study to suit education in any field of study at the post-secondary level.

The studies of Boyle (2001), Kuratko (2005) and Veciana et al., (2005) give a clue about the relationship between effectiveness of entrepreneurship education and infrastructure of institution, adequacy of human resource, financial strength, support for government and willingness and readiness of students to be educated. Though Kuratko (2005) and Veciana et al., (2005) have confirmed Boyle's (2001) discovery, it may not be necessarily applicable to Ghana, precisely in Ghanaian Technical Universities. This is owing to the fact that Boyle's (2001) study was based on a different population of a sufficiently large distinction, likewise the studies of Kuratko (2005) and Veciana et al., (2005).

METHODOLOGY

Research Design and Data Collection

This study mainly involved a quantitative research technique and a case study. Thus the study is a case study of the Technical University educational subsector; it focuses on factors that influence effectiveness of entrepreneurship education in Ghanaian Technical Universities. The application of OLS regression and other parametric statistical tools in the study in the face of hypothesis testing makes the study quantitative.

The main population of this study was administrative staff, lecturers and students of all the ten (10) Technical universities in Ghana. The target population (sampling frame) involved lecturers who teach entrepreneurship and senior administrative staff of the universities, precisely registrars. Technical universities were focused in this study as a result of their obligation to equip industry with technical competences through practical training. Thus Technical universities play a larger role in using pragmatic teaching methods in entrepreneurship to raise successful entrepreneurs (i.e. graduates who are able to use their skills and knowledge of entrepreneurship education to set up businesses). Moreover, administrative staff and lecturers are the direct stakeholders of entrepreneurship education among Technical universities; hence they were considered an appropriate source of primary data in this study. The population sizes of lecturers and administrative staff across the 10 Technical universities were 687 respectively. These figures were compiled based on information provided by Technical universities authorities.

The simple and stratified sampling techniques were used to select 500 respondents, made up of 320 lecturers and 180 administrative staff. Lecturers and administrative staff constitute the strata from which these sample sizes were reached through the balloting method of the simple random sampling technique. These sampling methods offered each population unit an equal chance of being included in the sample, and they came with the advantage of enabling the researcher to generalize findings. Thus about 73% of the members of the target population make up the sample size, and this substantial proportion of respondents is more likely to be sufficient for generalizing findings.

In this study, continuous primary data are used, and these involve scores (from 0 to 5) assigned by respondents to the extent of contribution of Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Students Readiness to effectiveness of education in the context of entrepreneurship education in all the Technical universities in Ghana. Since effectiveness of entrepreneurship education is observable and not a latent variable, the same scale is used to score this variable.

A self-administered questionnaire was the instrument used in collecting data in this study. This instrument measured the extent of financial adequacy, infrastructure adequacy, human resource adequacy, government support, and student readiness, as well as effectiveness of entrepreneurship education in Ghanaian Technical Universities in Ghana. The instrument involved close-ended items that enabled respondents to assign a score (from 0 to 5) to each of the six variables of the study based on their prevalence within the Technical Universities.

The instrument was applied in two pilot studies on the same population, and the results were used to estimate a reliability coefficient of 0.78 using the SPSS software. The researchers also used appropriate measures to ensure validity of the questionnaire. These measures include:

1. Aligning items of the questionnaire to the specific research objectives;
2. Making these items close-ended to avoid excessive non-response and response errors;
3. Using simple words and phrases in asking questions to meet respondents' adequate understanding on them;
4. Keeping the instrument short to encourage respondents to respond to all items and to do so within good time; and
5. Using a general structure and layout that elicited the needed information.

Prior to data collection, permission was sought from all participating Technical universities through the registrars. Dates of convenience were made available for administering questionnaires in each Technical university. Questionnaires were administered to lecturers and administrative staff in each Technical university on these dates, whilst the researchers ensured that appropriate guidance was given to respondents to avoid response errors. Completed questionnaires were compiled and double-checked for errors. The researcher did not call back to any of the campuses to rectify response errors due to the fact that questionnaires were adequately completed.

Hypotheses

Null hypothesis 1, H01: There is no difference in the extent of contribution of Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness to the effectiveness of entrepreneurship education in Ghanaian Technical universities.

Alternative hypothesis 1, H11: There is a significant difference in the extent of contribution of Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness to the effectiveness of entrepreneurship education in Ghanaian Technical universities.

Null hypothesis 2, H02: Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness cannot predict effectiveness of entrepreneurship education among Ghanaian Technical universities.

Alternative hypothesis 2, H12: Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness can significantly predict effectiveness of entrepreneurship education among Ghanaian Technical universities.

The first research hypothesis was analyzed using Analysis of Variance (ANOVA). The second research hypothesis was analyzed using OLS regression. Meanwhile, the appropriateness of applying these statistical tools was verified using suitable assumptions test. ANOVA is a generalization of student's t-test; thus it tests for a difference in the means of three or more levels of a group. ANOVA was therefore appropriate for testing the first research hypothesis under

fulfilled data normality condition. OLS regression was also used as a result of the need to express effectiveness of entrepreneurship education as a linear combination of Infrastructure Adequacy, Human Resource Adequacy, Government Support, Political Environment Suitability and Students' Readiness.

RESULTS

In this section, findings on the specific research objectives and hypotheses are presented. As a reminder, continuous data were employed in the study; hence the application of the chosen parametric statistical tool must be based on some fulfilled conditions. The first of these conditions has to do with the need for data associated with the dependent or outcome variable of the OLS regression and ANOVA to be normally distributed. Table 1 test this condition and other conditions necessary for using OLS regression and One-way ANOVA are tested in the course of presenting findings.

| | Kolmogorov-Smirnova | | Shapiro-Wilk | | | |
|---------------------------------------------|---------------------|-----|--------------|-----------|-----|-------|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Effectiveness | 0.337 | 500 | 0.321 | 0.712 | 500 | 0.242 |
| <i>"Lilliefors Significance Correction"</i> | | | | | | |

Table 1 comes with a test of normality for data associated with "*Effectiveness*", the outcome variable for the OLS regression and One-way ANOVA. The table comes with distinct statistics for the Kolmogorov-Smirnov and Shapiro-Wilk tests. For samples less than 2000, however, Shapiro-Wilk test is generally preferable. Since the study's sample size is 500, statistics of Shapiro-Wilk test are considered in the interpretation. From the table, the test is insignificant at 0.05 level of significance, Shapiro-Wilk (500)=0.712, $p=0.242$, and this indicates that data on the outcome variable, "*Effectiveness*" is normally distributed. The normality condition for applying OLS regression and ANOVA is therefore satisfied.

The first null hypothesis of this paper states that "*there is no difference in the extent to which Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Students' Readiness have contributed to the effectiveness of entrepreneurship education among Ghanaian Technical Universities*". This hypothesis is tested at a 0.05 level of significance. This test is carried out using One-way ANOVA.

| | Mean | Std. Deviation | N |
|-------------------------------|------|----------------|-----|
| Financial Adequacy | 3.58 | 0.63593 | 500 |
| Infrastructure Adequacy | 3.56 | 0.70951 | 500 |
| Human Resource Attractiveness | 3.76 | 0.57189 | 500 |
| Government Support | 2.64 | 0.74263 | 500 |
| Student Readiness | 3.51 | 0.64088 | 500 |

Table 2 shows the descriptive statistics associated with Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness. Thus the table comes with descriptive statistics that indicates the extent to which

Financial Attractiveness, Infrastructure Adequacy, Human Resource Attractiveness, Government Support and Student Readiness have contributed to effectiveness of entrepreneurship education in Ghanaian Technical Universities. In that regard, Human Resource Attractiveness has the highest average ($M=3.76$, $SD=0.57$), followed by Financial Adequacy ($M=3.58$, $SD=0.64$), with Government Support having the lowest average ($M=2.64$, $SD=0.74$). Possibly, Human Resource Adequacy has made the highest contribution to the effectiveness of entrepreneurship education in the Technical Universities, with Government Support making the least contribution in this respect.

| Levene Statistic | df1 | df2 | Sig. |
|-------------------------|------------|------------|-------------|
| 13.262 | 4 | 2495 | 0.143 |

Homogeneity of variances (among group members) is a basic condition in ANOVA test. Table 3 gives results of Levene's Test of Homogeneity of Variances. The table indicates that this test is insignificant at 0.05 level of significance, $p=0.142$ (i.e. $p>0.05$). The insignificance of the test reveals that there is homogeneity of variances among group members. This satisfies another basic condition in ANOVA test.

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|-----------------------|-----------|--------------------|----------|-------------|
| Between Groups | 388.400 | 4 | 97.100 | 220.974 | 0.000 |
| Within Groups | 1096.350 | 2495 | 0.439 | | |
| Total | 1484.750 | 2499 | | | |

Table 4 shows F statistic of ANOVA test. It tests the first null hypothesis that averages in Table 2 have no difference. From the table, the test is significant at 0.05 level of significance, $F(4, 2495) = 220.974$, $p=0.000$. Thus the first null hypothesis is not confirmed. It may be concluded that there is a significant difference in the extent to which Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness have contributed to the effectiveness of entrepreneurship education among Ghanaian Technical Universities. The presence of a significant difference requires that a Post Hoc test is carried out to shed light on the extent of the difference.

| (I) Level | (J) Level | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---------------------------|-------------------------------|------------------------------|-------------------|-------------|--------------------------------|--------------------|
| | | | | | Lower Bound | Upper Bound |
| Financial Attractiveness | Infrastructural Readiness | -0.18000* | 0.04192 | 0.000 | -0.2978 | -0.0622 |
| | Human Resource Attractiveness | 0.02 | 0.04192 | 1.000 | -0.0978 | 0.1378 |
| | Government Support | 0.94000* | 0.04192 | 0.000 | 0.8222 | 1.0578 |
| | Student Readiness | 0.07 | 0.04192 | 0.951 | -0.0478 | 0.1878 |
| Infrastructural Readiness | Financial Attractiveness | 0.18000* | 0.04192 | 0.000 | 0.0622 | 0.2978 |
| | Human Resource Attractiveness | 0.20000* | 0.04192 | 0.000 | 0.0822 | 0.3178 |
| | Government Support | 1.12000* | 0.04192 | 0.000 | 1.0022 | 1.2378 |
| | Student Readiness | 0.25000* | 0.04192 | 0.000 | 0.1322 | 0.3678 |
| Human | Financial Attractiveness | -0.02 | 0.04192 | 1.000 | -0.1378 | 0.0978 |

| | | | | | | |
|--------------------------------------------------------|---------------------------|----------|---------|-------|---------|---------|
| Resource Attractiveness | Infrastructural Readiness | -0.2000* | 0.04192 | 0.000 | -0.3178 | -0.0822 |
| | Government Support | 0.92000* | 0.04192 | 0.000 | 0.8022 | 1.0378 |
| | Student Readiness | 0.05 | 0.04192 | 1.000 | -0.0678 | 0.1678 |
| *The mean difference is significant at the 0.05 level. | | | | | | |

| (I) Level | (J) Level | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|--------------------------------------------------------|-------------------------------|-----------------------|------------|-------|-------------------------|-------------|
| | | | | | Lower Bound | Upper Bound |
| Government Support | Financial Attractiveness | -0.94000* | 0.04192 | 0.000 | -1.0578 | -0.8222 |
| | Infrastructural Readiness | -1.12000* | 0.04192 | 0.000 | -1.2378 | -1.0022 |
| | Human Resource Attractiveness | -0.92000* | 0.04192 | 0.000 | -1.0378 | -0.8022 |
| | Student Readiness | -0.87000* | 0.04192 | 0.000 | -0.9878 | -0.7522 |
| Student Readiness | Financial Attractiveness | -0.07 | 0.04192 | 0.951 | -0.1878 | 0.0478 |
| | Infrastructural Readiness | -0.25000* | 0.04192 | 0.000 | -0.3678 | -0.1322 |
| | Human Resource Attractiveness | -0.05 | 0.04192 | 1.000 | -0.1678 | 0.0678 |
| | Government Support | 0.87000* | 0.04192 | 0.000 | 0.7522 | 0.9878 |
| *The mean difference is significant at the 0.05 level. | | | | | | |

Tables 5 and 6 in the Appendix show Bonferroni Multiple comparison test associated with findings in Table 4. From Table 5, Financial Attractiveness is significantly different from Infrastructural Readiness ($p=0.000$) and Government Support ($p=0.000$) at 0.05 level of significance. Furthermore, Infrastructural Readiness is significantly different from all the other four variables at 0.05 significance level, where $p=.000$ for each pair of Infrastructural Readiness and the four other variables. Human Resource Attractiveness is significantly different from Infrastructural Readiness ($p=0.000$) and Government Support ($p=0.000$). In Table 6, Government Support is also significantly different from each of the other four variables at 0.05 level of significance, where $p=0.000$ for each pair of Government Support and the four other variables. It must be noted that Table 5 and 6 constitute a single table that is partitioned due to its large size. With findings in these two tables, those mean pairs without a difference can be seen. For instance, in Table 5, Financial Attractiveness is not significantly different from Student Readiness at 0.05 level of significance, ($p=0.951$).

The second research hypothesis of the study states that “*Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Students’ Readiness cannot predict effectiveness of entrepreneurship education in Ghanaian Technical Universities*”. Like the first hypothesis, this hypothesis is also tested at a 0.05 level of significance. This hypothesis is tested using OLS regression. Table 7 in the Appendix starts with this test.

| | | Effectiveness | Financial Adequacy | Infrastructure Adequacy | Human Resource Attractiveness | Government Support | Student Readiness |
|---------------------|-------------------------|---------------|--------------------|-------------------------|-------------------------------|--------------------|-------------------|
| Pearson Correlation | Effectiveness | 1 | | | | | |
| | Financial Adequacy | 0.708 | 1 | | | | |
| | Infrastructure Adequacy | 0.602 | 0.531 | 1 | | | |
| | Human | 0.606 | 0.593 | 0.455 | 1 | | |

| | | | | | | | |
|--|-------------------------|-------|-------|-------|-------|-------|---|
| | Resource Attractiveness | | | | | | |
| | Government Support | 0.44 | 0.273 | 0.444 | 0.358 | 1 | |
| | Student Readiness | 0.312 | 0.182 | 0.093 | 0.285 | 0.281 | 1 |

Table 7 shows Pearson's product-moment correlation between the outcome variable (*Effectiveness*) and the five independent variables, whose significance is a basis for OLS regression. The table indicates that "*Effectiveness*" is highly positively correlated to Financial Attractiveness (0.708, $p=0.000$), Infrastructure Adequacy (0.602, $p=0.000$) and Human Resource Attractiveness (0.606, $p=0.000$). "*Effectiveness*" is positively but weakly correlated to Government Support (0.440, $p=0.000$) and Student Readiness (0.312, $p=0.000$). The significance of these correlations validates the use of OLS regression in predicting "*Effectiveness*" from the five criterion variables.

| Table 8 MODEL SUMMARY ^b | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|-------------------|----------------------------|---------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1 | 0.799a | 0.639 | 0.635 | 0.34715 | 2.134 |
| ^a Predictors: (Constant), Student Readiness, Infrastructure Adequacy, Government Support, Human Resource Attractiveness, Financial Adequacy; ^b Dependent Variable: Effectiveness | | | | | |

Table 8 shows three important estimates of the OLS regression. Firstly, the R Square of 0.639 indicates the regression model is a strong one. It represents the proportion of variability, in this case 63.9%, contributed to "*Effectiveness*" by Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness. The Adjusted R Square gives a better estimate of R Square, which still indicates that the regression model is strong at 63.5%. In other words, Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness are strong predictors of effectiveness of entrepreneurship education in the Technical Universities of Ghana. The Durbin-Watson statistic tests for one basic condition of OLS regression, and this is the "*independence of error variances*" condition. Since the Durbin-Watson statistic is close to 2, this condition is satisfied.

| Table 9 ANOVA ^b | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|-----|-------------|---------|--------|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 105.266 | 5 | 21.053 | 174.696 | 0.000a |
| | Residual | 59.534 | 494 | 0.121 | | |
| | Total | 164.8 | 499 | | | |
| ^a Predictors: (Constant), Student Readiness, Infrastructure Adequacy, Government Support, Human Resource Attractiveness, Financial Adequacy; ^b Dependent Variable: Effectiveness | | | | | | |

Table 9 is an ANOVA test associated with the OLS regression model. It buttresses the strength of the model and serves as a good replacement for the "*lack of fit*" test, which verifies linearity of the OLS regression. Linearity of the OLS regression is another basic condition to be fulfilled in OLS regression. The ANOVA test is significant at 0.05 level of significance, $F(5,$

494)=174.696, $p=0.000$. This indicates that the linearity condition is also satisfied. Linearity in OLS regression means that the outcome variable can significantly be expressed as a linear combination of the criterion variables. Having said this, Table 10 in the Appendix comes with coefficients of the OLS regression model.

The general OLS regression model in this case is written as $Y=\alpha+B_1X_1+B_2X_2+B_3X_3+B_4X_4+B_5X_5$, where Y is “*Effectiveness*” of entrepreneurship education in the Technical Universities, X_1, X_2, X_3, X_4 and X_5 represent Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness respectively, α is the constant and B_1, B_2, B_3, B_4 and B_5 are coefficients of Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness respectively.

By substituting the unstandardized coefficients into this equation, $Y=0.17+0.39X_1+0.19X_2+0.17X_3+0.10X_4+0.12X_5$. The interpretation of this model is that a unit rise in Financial Attractiveness (X_1) increases the conditional mean of “*Effectiveness*” (Y) by 0.39 when the four other predictors are held fixed, and this change occurs at a rate from 0.33 to 0.45 of the confidence interval. This interpretation applies to the other predictors. The t test for each of the predictors is also significant at a 0.05 level of significance. In this regard, each of them significantly predicts “*Effectiveness*” of entrepreneurship education in Ghanaian Technical Universities.

Table 10
COEFFICIENTS^a

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95% Confidence Interval for B | | Collinearity Statistics | |
|-------------------------------|-----------------------------|------------|---------------------------|--------|------|-------------------------------|-------------|-------------------------|-------|
| | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Tolerance | VIF |
| 1 (Constant) | 0.17 | 0.126 | | 1.375 | 0.17 | -0.074 | 0.419 | | |
| Financial Adequacy | 0.39 | 0.033 | 0.431 | 11.927 | 0 | 0.325 | 0.454 | 0.56 | 1.786 |
| Infrastructure Adequacy | 0.19 | 0.028 | 0.231 | 6.616 | 0 | 0.131 | 0.242 | 0.601 | 1.663 |
| Human Resource Attractiveness | 0.17 | 0.036 | 0.164 | 4.601 | 0 | 0.094 | 0.235 | 0.576 | 1.735 |
| Government Support | 0.1 | 0.025 | 0.124 | 3.913 | 0 | 0.048 | 0.144 | 0.73 | 1.371 |
| Student Readiness | 0.12 | 0.026 | 0.131 | 4.494 | 0 | 0.066 | 0.168 | 0.867 | 1.153 |

Another condition that needs to be satisfied in OLS regression is the absence of collinearity or multicollinearity. In table 10, the Collinearity statistics help to know whether this condition is satisfied or not. For this condition to be satisfied the VIF (Variance Inflation Factor) values of all predictors must be less than 10, otherwise the condition is not met. From the table, none of the predictors has a VIF more than 10. Hence there is a higher chance that there was no multicollinearity problem with the data. The reliability and credibility of the OLS regression derived in this paper is fortified by the fulfilment of all the basic conditions of OLS regression analysis. The second null hypothesis of the study is rejected. Hence, Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Students’ Readiness significantly predict effectiveness of entrepreneurship education among Ghanaian Technical Universities.

The model established above can form a basis for improving the contribution of each variable to effectiveness of entrepreneurship education in Ghanaian Technical Universities. For instance, the model reveals that Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness positively impact effectiveness of entrepreneurship education in Ghanaian Technical Universities. The regression coefficients can be used to determine the relative contribution of each predictor to effectiveness of entrepreneurship education among Ghanaian Technical Universities. Government Support, for instance, contributes the lowest influence to the outcome variable. This might suggest that Government Support is minimal in granting entrepreneurship education in Ghanaian Technical Universities. Possibly, government needs to enhance its support for entrepreneurship education at the polytechnic level.

DISCUSSION

Based on findings of this study, it is evident that McKainsey's (2000) theory is confirmed. Thus the effectiveness of education in any field of study is influenced by Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy and Government Support. The OLS regression model established in this paper is supported by the study of Boyle (2001), who added Student Readiness to the original list of predictors on which McKainsey's (2000) theory is based. Likewise, the OLS regression reached in this study is supported by the studies of Kuratko (2005) and Veciana et al., (2005). So there is now ample evidence that effectiveness of entrepreneurship education in Ghanaian Technical Universities is influenced by Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness.

CONCLUSION

Conclusions with Relevant Policy Recommendations

The purpose of this paper was to examine factors that influence effectiveness of entrepreneurship education in Ghanaian Technical Universities. Five factors were confirmed to influence effectiveness of entrepreneurship education in Ghanaian Technical Universities. These include Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness. There was a significant difference in the extent to which Financial Adequacy, Infrastructure Readiness, Human Resource Adequacy, Government Support and Student Readiness contributed to the effectiveness of entrepreneurship education in Ghanaian Technical Universities. Human Resource Attractiveness contributed most to effectiveness of entrepreneurship education, whilst the least contribution was made by Government Support. Additionally, Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness significantly predicted effectiveness of entrepreneurship education in Ghanaian Technical Universities. Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness accounted for 63.5% of variability in effectiveness of entrepreneurship education, and this made the OLS regression strong. Effectiveness of entrepreneurship education in Ghanaian Technical Universities can be expressed as a linear combination of Financial Adequacy, Infrastructure Adequacy, Human Resource Adequacy, Government Support and Student Readiness Government support makes the least contribution to the conditional mean of

Y; hence government would meet to enhance its support for entrepreneurship education in Ghanaian Technical Universities to maximize the effectiveness of entrepreneurship education. The credibility and reliability of this OLS regression model is strengthened by the fact that all the basic conditions under which OLS regression is applied were satisfied.

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