

Impact of personality, human capital, and environmental influences on students' entrepreneurial potential: The case of I. T. Management and Business Administration final year students of UPSA, Ghana

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ABSTRACT: This work was aimed at investigating the impact of human capital-driven factors, personality-driven factors, and environmentally driven factors on the entrepreneurial potential of the students at the University of Professional Studies, Accra (UPSA), Ghana. With 188 respondents retrieved out of 249 questionnaires sent to Information Technology and Business Administration final year students of UPSA, Ghana, and using ordinal regression analysis, the following results were revealed: the "Entrepreneurial potential" of the students depends on their personality traits of "Need for achievement" and "Risk tolerance" and the human capital factor of "Entrepreneurship education and training". "Entrepreneurship education and training" is the most significant predictor with a p-value of 0.004, followed by "need for achievement" with a p-value of 0.033, and then "risk tolerance" with a p-value of 0.036.

KEYWORDS: Entrepreneurial, students, potential, personality, human capital, environmental, influences.

1 BACKGROUND

Currently, there is a powerful worldwide drive to encourage more learners to consider and pursue venture development as an alternative career route for graduates ([1], [2]). As a consequence, many writers have researched factors affecting the business career intentions and motivations of learners in both developed and developing nations (e.g [3], [4]) as well as the role of universities in promoting entrepreneurship among learners ([5], [6], [7]).

Unemployment, to the ordinary person on the street, is "not having a sustained job that can take care of him and his family". This simple definition of unemployment eliminates contract and temporal jobs since they are not sustained jobs. Baah-Boateng [8] gave a simple definition of unemployment as "a phenomenon of job-seeking resulting out of joblessness". This definition presupposes that to be declared unemployed, one must search for a job for some time and still be without a job because he or she has not got one. Not seeking a job and for that matter not getting a job places you outside the unemployment bracket. More technically, the International Conference of Labor Statisticians (ICLS) of the ILO declares one unemployed if that person is of working age (e.g. 15+ years in Ghana), and for a specified reference period (either a day or a week), that person had been:

- 'without work', not even for one hour in paid employment or self-employment of the type covered by the international definition of employment.
- 'currently available for work', whether for paid employment or self-employment; and
- 'seeking work', by taking active steps in a specified recent period to seek paid employment or self-employment.

This definition also suggests that if a person is not available for work, and there is work available, he or she cannot be classified as unemployed. The same applies to a person who is working but is not satisfied and is seeking another job.

In Ghana, graduate unemployment is on the ascendancy. Many students graduate from universities each year in Ghana without any hope of ready jobs. This has led to the formation of many unemployment groups, notable of them is the Unemployed Graduates Association of Ghana (UGAG), now the Association of Graduates in Skill Development (AGSD-GH), which was formed in 2011 (<https://ugagghana.com/>). Governments over the past few years have all tried in their way to curb this phenomenon,

even though not adequate to resolve the problem. Recently, the Government of Ghana in 2018 launched the "Nations Builders Corps (NABCO)". The NABCO program is a government initiative to address graduate unemployment to solve social problems. The focus of the initiative was aimed at solving public service delivery in health, education, agriculture, technology, governance, and drive revenue mobilization and collection (<https://nabco.gov.gh/>). The objectives of the program were to provide temporary employment, improve skills and employability, improve public sector delivery, improve revenue mobilization, and improve access to basic public services. Under the program, graduates were trained, equipped with the necessary work tools, and deployed around the country to engage in the following programs: Educate Ghana, Heal Ghana, Feed Ghana, Revenue Ghana, Digitize Ghana, Civic Ghana, and Enterprise Ghana. It was reported that about a hundred thousand graduates were provided with jobs, and that concerning persons without diplomas or degrees, the President of Ghana on the day of the launch indicated that NABCO was freeing up the Youth Employment Agency (YEA-also an initiative of the Government of Ghana to curb unemployment among the youth) of the burden of dealing with everything to do with the employment of the youth, especially graduates. He explained that NABCO was granting YEA extra absorptive capacity to concentrate on non-graduates. Placements would last for three (3) years, earning NABCO trainees a stipend of seven hundred (700) Ghana cedis every month (Source: ISD (Rex Mainoo Yeboah: <http://www.ghana.gov.gh/index.php/media-center/news/4617-nation-builders-corps-to-create100-000-jobs>). These programs that seek to curb youth and graduate unemployment in Ghana have been on with successive Governments, but the fact is, the problem of unemployment still exists and has become a national problem, as well as a security concern.

Several reasons have been put forward by researchers as the causes of unemployment worldwide and in Africa. Baah-Boateng [8] in his work on "determinants of unemployment in Ghana", noted that there is a high incidence of unemployment among the youth and secondary school leavers in the most recent period and that this requires deliberate and focused intervention including support for entrepreneurial training and start-up capital to attract young school leavers to become 'creators' rather than 'seekers' of jobs. Two main causes of unemployment emerge from Baah-Boateng's work: lack of individual skills or entrepreneurial skills and lack of start-up capital. These two causes are linked in the sense that one may be having entrepreneurial skills but may lack start-up capital to begin something profitable. Another may have the start-up capital but maybe lacking entrepreneurial skills. The two are, therefore, necessary conditions to have to succeed. Theory-intensive secondary school and university curriculum, government's misplaced priorities, corruption, nepotism, droughts, lack of specific job skills among the youths, preference of white-collar jobs, dislike of lowly paying jobs, and educated youths who shun manual intensive jobs are but some of the causes Bhebhe et al [9]. singled out in their study on the causes of unemployment among youths in the city of Harare, Zimbabwe.

In a study conducted in Nigeria on the causes, effects, and solutions to youth unemployment problems in Nigeria, Uddin and Uddin [10] emphasized the need for the government to invest heavily in education to enable the youth to become self-reliant instead of job seekers through skills development and training. They mentioned the following as the major causes of unemployment in Nigeria: Rural-Urban Migration, Rapid Population Growth, Low Standard of Education, Rapid Expansion of the Educational System, Lack of Steady and Sustainable Power Supply, Corruption. The three studies looked so far point to one major cause of unemployment among the youth: lack of entrepreneurial skills resulting from improper education (curricula not focused on entrepreneurship) and also attitudes and behaviors on the part of the unemployed.

Lack of entrepreneurial skills may be due to several factors: personality issues, human capital issues, and environmental issues, according to the complex process model of entrepreneurship by Kerr, Kerr, and Xu [11] after doing a comprehensive review of entrepreneurship traits of entrepreneurs, and so on, from the year 2000.

The main objective of this study is to contribute to the general body of knowledge and research work in entrepreneurship drive among the youth, and especially, graduates from universities. To achieve this objective, the research is targeted at addressing the following specific objectives:

1. To investigate the impact of human capital-driven factors on the entrepreneurial potential of the students
2. To investigate the impact of personality-driven factors on the entrepreneurial potential of the students
3. To investigate the impact of environmentally driven factors on the entrepreneurial potential of the students

The study is premised on the fact that entrepreneurial potential or ability is not automatic; it depends on several factors. The study, therefore, intends to investigate the dependencies of entrepreneurial potential on these factors among university graduates in UPSA.

1.1 LITERATURE REVIEW, CONCEPTUAL AND THEORETICAL FRAMEWORKS

Entrepreneurship has become a very important subject of discussion in tertiary institution curriculum building worldwide, as well as in national economy building, due to the high rate of unemployment globally. Entrepreneurship can create jobs for individuals and help create jobs for those who will be employed by these individuals. This rippling effect tends to better the lives of many in a community. Entrepreneurship education is therefore essential in creating the drive and skills for prospective entrepreneurs. Moving away from "white color jobs" is not entrepreneurship, because the creation of white color jobs by

individuals is also entrepreneurship. However, because of the lack of initial capital to start such businesses, it is always advised that individuals start small and medium scale businesses that are not so capital intensive, and do not require higher learning to start them. This brings to the fore, the importance of developing more of the middle manpower personnel who are equipped with mostly vocational and technical skills to set up businesses on their own to help build the economy.

1.2 WHAT IS ENTREPRENEURSHIP?

The word entrepreneur finds its origin in the French word "entreprendre", which means "to undertake". During the early 16th century, the term was used for the persons engaged in military expeditions, and in the 17th century, it was extended to cover construction and civil engineering works. The term was used in the context of business and economic activities only in the 18th century. Richard Cantillon, a French banker, is credited for the first time by using the word 'entrepreneur' to mean a person who bears uncertainty and risk. One of the earliest definitions' according to Cantillon [12] sees the entrepreneur as the one who always searches for change, responds to it, and exploits it as an opportunity.

Entrepreneur, according to Onuoha [13] "is the one who initiates a new organization or revitalizes an organization, in particular new businesses, generally in response to identified opportunities." Bolton and Thompson [14] have also defined an entrepreneur as "a person who normally creates and innovates to build something of recognized value around perceived opportunities." Another group of researchers also saw an entrepreneur as a term correlated to entrepreneurship hence, defined it as an activity that involves the discovery, evaluation, and exploitation of opportunities to introduce new goods and services, ways of organizing, markets, processes, and raw materials through organizing efforts that previously had not existed [15].

A person is an entrepreneur so long as they are engaged in entrepreneurial behaviors. As stated above, a person starts being an entrepreneur when they undertake or form a new venture and are no longer an entrepreneur when the process of organization building has resulted in managing a self-sustaining business.

Another researcher has also coined the term Entrepreneur to mean the one who always searches for change, responds to it, and exploits it as an opportunity [16]. One of the most talked-about definitions which focused the term based on making a profit is Scarborough [17] who argues that entrepreneurship is about creating something new in an uncertain environment and for profit. His definition seemed to have an interest in most business ideologists since it lights out what businesses seek to achieve.

Many definitions of entrepreneurship highlight the importance of seeking profits. However, Barringer and Ireland [18] claim that entrepreneurship is about pursuing and recognizing opportunities and putting useful ideas into practice. Also, the entrepreneur here is the individual (or team) that identifies the opportunity, gathers the necessary resources, creates, and is ultimately responsible for the consequences of the organization.

1.3 CONCEPTUAL FRAMEWORK

The work is premised on the model developed by Kerr, Kerr, and Xu [11] in their paper "Personality Traits of Entrepreneurs: A Review of Recent Literature". In their paper, they reviewed extant literature on the personality traits of entrepreneurs and came out with a complex process model of entrepreneurship. The model considers three main determinants or factors of entrepreneurial potential or orientation. These three determinants are the personality of a person, the human capital, and the environment. Entrepreneurship does not happen in a vacuum, and for every effort to begin and run a fresh company, personality traits, human capital, and environment weave the context [11], and these are discussed below.

1.3.1 PERSONALITY FACTORS

For the personality dimension, the traits Kerr, Kerr, and Xu [11] were able to gather from literature are Need for Achievement, Locus of control, Self-Efficacy, Innovativeness, Risk Attitude, Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. All these traits to a large extent have some relationship with entrepreneurial potential, either direct or indirect, depending on how it is looked at ([19], [20], [21]) although some research questions this relationship [22]. This study employs only three for its analysis, namely, Need for Achievement, Risk Tolerance, and Locus of Control. The choice of these three stems from the position of Barrick and Mount [23] which they argue that particular traits depend on an explicit description of entrepreneurial operations that may be located in a moment, location, and role, and that is why particular features or characteristics such as risk tolerance, need for accomplishment or locus of control are more helpful in anticipating entrepreneurial performance than the "Big Five", which are included in or part of the ten traits mentioned earlier.

Again, according to Frese [24] the need for achievement, locus of control (self-efficacy), innovation, risk-taking are significant characteristics of personality, while education, experience, mental capacity, and understanding are significant characteristics of human capital for entrepreneurial orientation [24]. The three personality factors (Need for Achievement, Locus of Control, and Risk Tolerance) are discussed below.

1.3.1.1 NEED FOR ACHIEVEMENT

"Need for achievement" (N-Ach) relates to the desire for the meaningful achievement of an individual ([25] - [28]). It also relates to a tendency to choose and continue in operations that have a mild chance of success or those that provide maximum opportunity for satisfaction with personal accomplishment ([27], [28]). Murray [29] first launched the idea and later McClelland ([27], [30]) created and popularized it. McClelland was the first to advocate an empirical connection between the personal need for achievement (N-Ach) and entrepreneurial activity [27].

McClelland, later, showed a strong correlation between the need for accomplishment (N-Ach) and entrepreneurial success [31]. Even though many researchers of N-Ach ([32] - [39]) are of the view that a high need for achievement predicts entry into entrepreneurship, still others ([40], [41], [25]) challenge it by proving that it is contextual; for example, Mueller and Thomas [42] found out that Swiss entrepreneurs have a higher need for achievement than U.K. entrepreneurs, suggesting that the trait differs or varies across cultures and countries.

1.3.1.2 LOCUS OF CONTROL

Locus of Control (LoC) is the degree of control of a person over his/her life [43]. A person with an internal LOC conceptualizes that their own choices control their lives, while those with an external LOC believe that the true controlling factors are chance, fate, or environmental characteristics that they cannot affect [11]. LoC is a trait of personality that demonstrates the amount of sensation of command. Hisrich and Peters [44] think that LoC is "an attribute that indicates a person's feeling of command over life." Green et al [45]. also think that LoC is "the degree to which an individual sees success and failure as conditional on his or her private projects."

The notion of LoC was first launched by Rotter's [46] theory of social learning. Individuals with inner LOC think that they can affect results rather than external forces controlling these results by their capacity, effort, or abilities.

In the literature, several studies have been performed to confirm that inner LoC affects entrepreneurial intentions ([47], [48], [42], [49]).

Previous research connected faith in internal control with the probability of participating in business or entrepreneurial activities (e.g., [43], [50] - [54]).

People with greater inner locations will take risks and set up companies. They think the environment can be controlled by their actions. Many surveys have shown that businessmen have greater LoCs than others ([42], [47], [48], [55]).

1.3.1.3 RISK TOLERANCE

Risk-taking is exposure to danger. This is because the risk-taker is not too sure of the consequences of his actions; it is an exercise clouded with uncertainties. Risk-taking can, however, result in positive consequences, especially if a calculated risk is taken. A calculated risk is a risk that the risk-taker tries to do some prior analysis to reduce considerably the probability of it not yielding or producing positive results. Risk-taking is a personality trait that demonstrates a person's readiness and inclination to take risks [43].

Entrepreneurial activity has risks, so taking risks is linked to entrepreneurial activity [43]. A risk-taking propensity is dealing with risk and uncertainty and being willing to bear it. People who take risks can choose less fortunate but advantageous options. In uncertain circumstances, they want to create more choices [43]. Leaders and entrepreneurs are risk-takers more than managers because managers follow strict policies and procedures of organizations to execute their work, but entrepreneurs create opportunities out of uncertainties. Entrepreneurs take multiple risks concerning capital, career, prestige, and family; an individual with an entrepreneurial intention should be optimally risk-oriented.

Research has shown that entrepreneurs are among the class of people who take risks more than all other people ([56] - [59]). Begley and Boyd [60] state that risk-taking propensity demonstrates how an individual copes with circumstances of dangerous choice. Matthews and Scott [61] think that for entrepreneurial thinking and being an entrepreneur, risk tolerance is necessary.

Stewart and Roth [62] are of the view that entrepreneurs take risks [63]. Chen et al [64]. also find that in innovation and risk-taking, company founders have a greater Entrepreneurial Self-Efficacy (ESE) than non-founders.

1.3.2 HUMAN CAPITAL FACTORS

According to the model developed by Kerr, Kerr, and Xu [11] human capital factors have four dimensions: Education and training, Mental Ability, Experience, and Knowledge. Education and training in this context have to do with curriculum-based

courses or deliberate academic programs that are run to help develop the students' entrepreneurship intentions. The mental ability of the students has to do with the ability of the students to retain what they have learned in entrepreneurship in school and the ability to recall and make use of it when the need arises. Experience deals with one's involvement in entrepreneurial activities, and knowledge has to do with facts, information, and skills acquired through entrepreneurial experience or education, the theoretical or practical understanding of the entrepreneurial subject.

For this study, we will drop mental ability, knowledge, and experience and retain or maintain education and training in the model, even though literature will be reviewed on entrepreneurial experience as well. Measuring mental ability, experience, and knowledge will be well suited for a qualitative study, where respondents can be taken through detailed or rigorous questioning on entrepreneurship to ascertain their competence. For a quantitative study of this sort or nature, it will be quite difficult to ascertain that. Education and training can easily be determined, coded, and included in quantitative analysis. Entrepreneurial education and training and entrepreneurial experience are discussed below.

1.3.2.1 ENTREPRENEURSHIP EDUCATION AND TRAINING

Entrepreneurship education today has spread to almost every institution of higher learning in the world after it was first introduced by Professor Baumann of the Massachusetts Institute of Technology (MIT) in 1958 [65]. It has been recorded that entrepreneurial activities have thrived well in areas close to institutions and universities where entrepreneurship education has been taken seriously. McIntyre and Roche [66] report that the number of corporations per capita (a measure of business activity) stopped declining in the late 1960s and started to increase. This development was enough proof of the fact that entrepreneurship education was necessary for entrepreneurial potential, and this resulted in many universities offering entrepreneurship courses [67]. Entrepreneurship education gained another boost in the 1970s because economists had demonstrated a beneficial effect on job creation from small business development [66].

Entrepreneurship education enables its attendees to participate constantly in different entrepreneurial activities, thereby enhancing their trust in the future performance of such duties [68]. Entrepreneurship education is so important that it can be used as an avenue to instill into the students most of the traits needed (for example, risk-taking and self-efficacy) for entrepreneurial activities. Riyanti [69] claims that having a desire to be an entrepreneur is not powerful enough to drive learners into being entrepreneurs and that learners need high risk-taking and self-efficacy. It can, therefore, be suggested that education in entrepreneurship also concentrates on building self-confidence to be an entrepreneur.

1.3.2.2 ENTREPRENEURIAL EXPERIENCE

A student's exposure to entrepreneurial activities may result in a positive or negative entrepreneurial potential in the person. A typical scenario may be a situation where a student tries a simple venture and may have to go through a tedious bureaucratic system for say, acquisition, and registration of a piece of land as part of the necessary things needed for the setting up of the business. Such an experience may kill every desire in the student for venture creation in the future. At the same time, this experience may present to the student as a challenge to be overcome and hence will devise strategies to surmount in the subsequent ventures.

The debate of prior entrepreneurial experience and the success of new ventures has been around for some time now ([70] - [72]). The common belief or notion is for venture success for those with prior entrepreneurial experience ([73], [74]) as against novice, that is, those with no prior entrepreneurial experience and who own a business [74]. The argument recently posits that success breeds success [76] and so it is more likely for entrepreneurs with prior successful experience in entrepreneurship to succeed than a novice. The question then is asked whether failure also breeds failure or success. It has been found by some researchers that by the nature of entrepreneurs, they are normally not perturbed about failure, and so a failure in prior entrepreneurial experience, usually result in positive future ventures ([73], [77]) entrepreneurs learn through experience and improvisation. Other researchers are of a different or opposing view. By a quantitative approach, these researchers ([72], [78], [79]) are of the view that prior entrepreneurial failure experience does not lead to subsequent venture survival. This presents a paradox that requires further investigation. For this work, we take entrepreneurial experience out of the model as explained earlier, but questions on it will be asked and analyzed.

1.3.3 ENVIRONMENTAL FACTORS OR INFLUENCES

The environment one finds himself in can have a great impact on his entrepreneurial potential. Some smart employees can take advantage of the dynamism of a particular industry to veer into entrepreneurship to fill some needful gaps that may not be the focus of the main players in the industry. Job instability and frequent redundancy treats can also push employees to venture into other businesses for survival. Economic hardships are the worst culprits in this game; while some do nothing during those periods, others seize the opportunity to do entrepreneurial exploits.

For students, several environmental factors can help them develop entrepreneurial potential. Two key influences which this work will investigate are the unemployment situation and helps for start-ups.

1.3.4 ENTREPRENEURIAL POTENTIAL

Potential simply means having or showing the capacity to develop into something in the future. Entrepreneurial potential ([80] - [92]) therefore, goes beyond the *desire* to be an entrepreneur, but also the *ability* to be. This is quite different from entrepreneurial orientation ([93] - [95]) which refers to the "processes, structures, and/or behaviors that can be described as aggressive, innovative, proactive, risk-taking, or autonomy seeking [95] and Entrepreneurial intention ([97], [98] - [100]) which just refers to "intentions to start-up a business" ([83], [84], [92], [101]).

This work sticks to the term, "entrepreneurial potential", as is a measure of "desirability and feasibility" to start a business [86]. Likewise, Veciana et al [92]. refer to entrepreneurial potential (EP) as "perceptions of the desirability and feasibility of the development of new ventures" [92]. Lumpkin and Dess [96] also advocated the use of the term entrepreneurial potential, suggesting that the undertaking of new ventures is a distinct concept that represents the "will and likelihood." Kakkonen [102] in her research explains that students need to be willing and motivated to be entrepreneurs and that they have the potential to do so. Kakkonen [102] studied the business competencies and entrepreneurial potential of university students and discovered that students were confident in assessing their business competencies and the perceptions of their entrepreneurial intent were low [102]. The conceptual framework is therefore represented in figure 1 below:

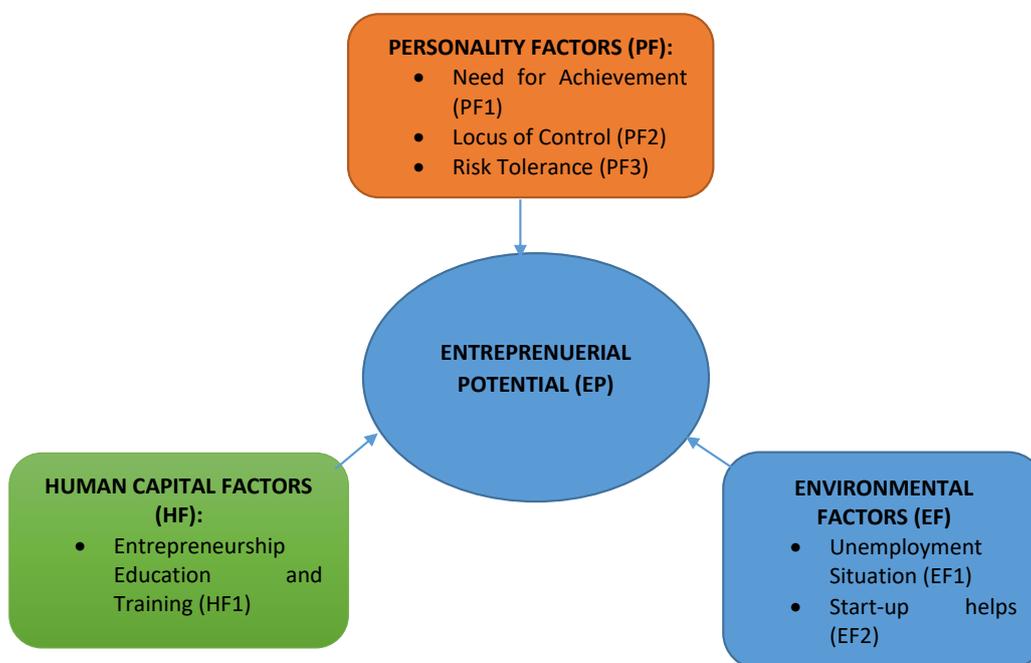


Fig. 1. Conceptual Framework

1.3.5 THEORETICAL FRAMEWORK

The theoretical framework deduced from the conceptual framework is shown in below:

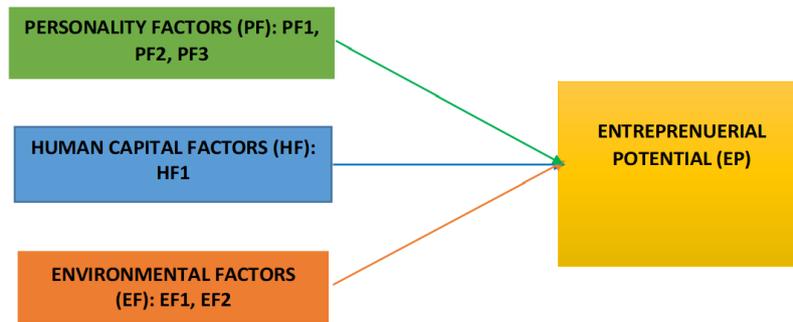


Fig. 2. Theoretical Framework

From above, the independent variables under consideration are Personal Factors (PF), Human Capital Factors (HF), and Environmental Factors (EF), and the dependent variable is Entrepreneurial Potential (EP).

2 MATERIALS AND METHODS

2.1 RESEARCH DESIGN AND METHOD

This research adopts a purely quantitative approach. The quantitative approach is employed because it involves the systematic empirical investigation of social phenomena via statistical, mathematical, or computational techniques. The objective of quantitative research is to develop and employ mathematical models, theories, and/or hypotheses about phenomena, which forms part of the scope of this work. Quantitatively, some of the data gathered from the questionnaires are coded into a 5 category Likert scale that is analyzed using statistical models and tests and interpreted.

We use the ordinal regression model as employed in SPSS because the data, especially the fact that the data of the dependent variable are of the ordinal type, and the independent variables are also ordinal, which are considered in SPSS as factors. The general ordinal regression model is as follows:

Taking the dependent variable EP as in figure 2, we have

$$\ln(\theta_j / 1 - \theta_j) = \beta_0j - \beta_1PF1 - \beta_2PF2 - \beta_3PF3 - \beta_4HF1 - \beta_5EF1 - \beta_6EF2 \quad (\text{eqn. 1})$$

The function on the left-hand side of the equation is termed the logit function. β_n (where n is from 1 to 6) is the coefficient of an independent variable. Each logit has its β_0j term but the same coefficient β . That means that the effect of the independent variable is the same for different logit functions.

2.2 RESEARCH FORMAT

The research format is predominantly causal. It is a causal study because the study is interested in finding relationships as is demonstrated by the model above. Here we are looking at the concomitant variation—the degree to which a presumed cause (e.g. Need for Achievement (PF1)) and a presumed effect (Entrepreneurial Potential (EP)) occur together or vary together. With a causal study, we are interested in the relationships and the interpretation of the relationships between dependent (response) and independent (predictor) variables.

2.3 TECHNIQUES/TOOLS/APPROACHES/INSTRUMENTATION/DEVICES

The 5 categories Likert scale is used for the questionnaire administration. This is an ordered scale with code 1 representing the worst case up to code 5 representing the best case. This goes for both dependent and independent variables, where applicable. Likert scale data is an ordinal data type that requires non-parametric tests and nonparametric regression methods.

The regression model stated earlier has been modeled based on the ordinal regression model which is non-parametric. SPSS (Statistical Package for the Social Sciences) is employed to run the statistics (both descriptive and inferential). A non-parametric analysis is interested in the following: Spearman rank correlation coefficient, parameter estimates, Strength of Association-Pseudo R Square: Cox and Snell R², Nagelkerke's R², McFadden's R², overall fitting test, and parameter significance.

2.4 DATA COLLECTION METHODS

This study uses or employs primary data for its analysis. No secondary data was used. All the information was gathered from the questionnaire administration. Using the 5 categories Likert Scale, there were 7 constructs; 6 questions were asked for the dependent variable (EP) construct. For the independent variables constructs (6 in all), they were all considered as ordinal (factors in SPSS). The ordinal type of independent variables still followed the 5 categories Likert scale where answers/responses to these questions were coded from 1 to 5, analyzed in SPSS, and then interpreted. Hard copies of the questionnaire were administered to Regular Business Administration and IT Management final year students in class over a week.

2.5 POPULATION AND SAMPLING PROCEDURES

The population studied was the final year Business Administration and IT Management regular students of UPSA. The choice of these two departments was due to the ease of getting access to the students, and nothing more. Other departments could have been included but getting access to the students and research assistants to administer the questions was a problem. The sampling method employed was probability sampling (random sampling). Students were chosen at random in the Business Administration class and the IT Management class to answer the questions.

2.6 SAMPLE SIZE CALCULATION

The population figure for Business Administration and IT Management final year regular students was 705 (612 for Business Administration and 93 for IT Management). The sample size was calculated using the formula below:

$$n = \frac{Z^2 * P (1-P)/e^2}{1 + ((Z^2 * P (1-P))/ e^2 N)}$$

Where N=Population=920, Z score= 1.96, P=sample proportion=50%=0.5, e=error margin=5%=0.05

The sample size realized was 249 students to be chosen at random. Based on this figure, 249 questionnaires were administered at random to the stated population.

3 RESULTS AND DISCUSSIONS

3.1 INTRODUCTION

This section deals with the analysis of the survey questions using statistical methods in the bid to answer the stated objectives. The questionnaire is made up of Likert scale constructs. The Likert scale constructs are 7 in number; six independent variables (PF1, PF2, PF3, HF1, EF1, EF2), and one dependent or response variable (EP). All the seven variables are of the ordinal type, requiring non-parametric analysis. In SPSS, all these variables are treated as factors. Concerning the theoretical framework, PF1, PF2, and PF3 are all personality factors representing "Need for Achievement", "Locus of Control", and "Risk Tolerance" respectively. HF1 is a human capital factor of "Entrepreneurship Education and Training". EF1 and EF2 are Environmental factors representing "unemployment situation" and "start-up helps" respectively. EP represents "entrepreneurial potential". The Likert scale questions are 37 in number (questions were picked from researchers who have worked in this area of specialty-see Appendix). The analysis of the ordinal model is intended to answer study objectives 1 to 3. As stated earlier, 249 questionnaires were administered at random, but 188 were retrieved, representing 75.5%. The remaining 24.5% that were not retrieved might be due to the rumors of Covid-19 lockdown, which became intense, as had happened in other countries, and most of the students went home. Feeding back the 188-sample size into the sample size formula and making the margin of error the subject of the formula gives a new margin of error of 6.125%, which is not out of the normal. With this figure, it means the author is 95% sure that 50% of the population of students in question (Business Administration and IT Management final year regular students in UPSA), are in agreement with the representations based on the administered questionnaire of the 188 students, give or take 6.125%.

3.2 NON-PARAMETRIC ANALYSIS

3.2.1 RELIABILITY TESTING

The survey involved a multiple-item measure for each of the seven constructs. Cronbach’s alpha method was used for the test. The result of 0.7 and above implied an acceptable level of internal reliability (Table 1). Nunnally [103] has indicated 0.7 to be an acceptable reliability coefficient. Referencing Table 1, it can be said that the Cronbach’s alphas for all five constructs (PF1-Need for Achievement, PF2-Locus of Control, PF3-Risk Tolerance, HF1-Entrepreneurship Education and Training, EF1-Unemployment Situation, EF2-Start-Up helps) were above the threshold (0.7), indicating acceptable levels of internal reliabilities. Thus, question items defined under each construct were well related and aggregated to give a common view about the associated construct.

Table 1. Reliability Statistics

Cronbach's Alpha	N of Items
0.742	37

3.2.2 MEASURES OF CENTRAL TENDENCY FOR CONSTRUCTS

The median score for all the questions under each construct for all the 188 respondents was recorded to represent the responses for all the constructs. This complete median score matrix showing responses for all 188 observations or respondents for each construct was fed into SPSS software for further computation and analysis. presents the overall scores of the median, mean, and standard deviations for each construct.

Table 2. Constructs' measures of central tendency

	Need for achievement	Locus of control	Risk tolerance	Entrepreneurship education and training	Unemployment situation	Start-up helps	Entrepreneurial potential
N	Valid	183	185	186	188	187	186
	Missing	5	3	2	0	1	2
Mean	4.3333	3.0108	3.7634	3.9362	3.9091	4.2713	4.4570
Median	4.0000	3.0000	4.0000	4.0000	4.0000	4.0000	5.0000
Std. Deviation	0.60523	0.97796	0.79045	0.91111	1.01984	0.74992	0.65824

3.2.3 ORDINAL REGRESSING ANALYSIS

below is the output of the response variable, Entrepreneurial potential. Looking at the output, the link function complementary log-log $f(x) = \log(-\log(1-x))$ is recommended since the probability of higher category is high.

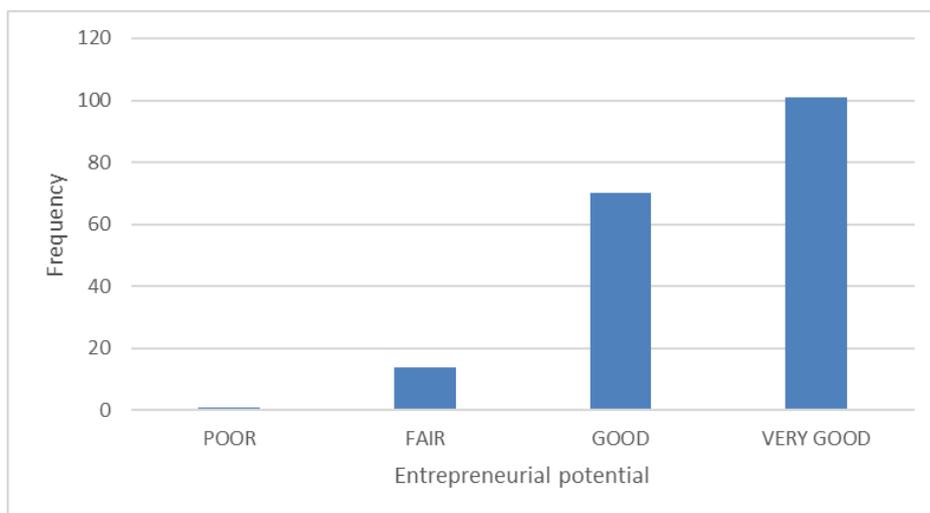


Fig. 3. Entrepreneurial potential output

3.2.4 PLUM ABSTRACT OUTPUT

The ordinal regression is implemented with the PLUM facility in SPSS. The response variable is Entrepreneurial Potential (EP), and the independent variables or predictors are Need for Achievement (PF1), Locus of control (PF2), Risk Tolerance (PF3), Entrepreneurship Education and Training (HF1), Unemployment Situation (EF1), and Start-up helps (EF2). All six independent variables are treated as factors in SPSS. The analysis of the PLUM output is shown in the ensuing sub-sections.

3.2.5 MODEL FITTING INFORMATION

The model fitting information is shown in below:

Table 3. Model fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	293.219			
Final	245.788	47.431	22	0.001
Link function: Complementary Log-log.				

Model Fitting Information tells us whether the model gives adequate predictions or not. On the Model fitting information output, if the difference between the two log-likelihoods—the chi-square— has an observed significance level greater than 0.05, it means that you can accept the null hypothesis that the model without predictors is as good as the model with the predictors. This also means that the predictors or the independent variables do not have any significant impact on the response variable. From Table 3, significance $p=0.001 < 0.05$, hence we conclude that predictors have a significant impact on the response variable.

3.2.6 GOODNESS-OF-FIT

Information on Goodness-of-fit is shown in below:

Table 4. Goodness-of-fit

	Chi-Square	df	Sig.
Pearson	2390.137	398	0.000
Deviance	219.449	398	1.000
Link function: Complementary Log-log.			

The goodness-of-fit output contains Pearson's chi-square statistic for the model (as well as another chi-square statistic based on the deviance). We start from the null hypothesis that the fit is good. If we do not reject this hypothesis (i.e. if the p-value is large), then you conclude that the data and the model predictions are similar and that you have a good model. From Table 4, Goodness-of-fit is not certain since Pearson's significance 0 is less than 0.05, and Deviance's significance 1 is greater than 0.05. For the determination of a good fit or a bad fit, both significance figures must be greater than 0.05 or less than 0.05, respectively.

3.2.7 STRENGTH OF ASSOCIATION

below shows the strength of the Association.

Table 5. Pseudo R-Square

Cox and Snell	0.233
Nagelkerke	0.279
McFadden	0.147
Link function: Complementary Log-log.	

In measuring the strength of association between the dependent variable and the independent/predictor variables in ordinal regression, there are several -like statistics that can be used or employed. Three commonly used statistics are Cox and Snell,

Nagelkerke, and McFadden. We choose Nagelkerke since it is the best and largest among the three, and for the fact that it is an adjusted version of the Cox & Snell that adjusts the scale of the statistic to cover the full range from 0 to 1. From Table 5, a Nagelkerke value of 0.279 simply means that the model explains about 27.9% of the variation in the response variable.

3.2.8 TEST OF PARALLEL LINES

Information on the Test of parallel lines is shown in below.

Table 6. Test of parallel lines

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	245.788			
General	191.725 ^b	54.063 ^c	44	0.142

The key assumption in ordinal regression is that the effects of any explanatory variables are consistent or proportional across the different thresholds, hence this is usually termed the assumption of proportional odds (SPSS calls this the assumption of parallel lines but it is the same thing). This assumes that the explanatory variables have the same effect on the odds regardless of the threshold. From the Test of parallel lines output, the entry labeled Chi-Square is the difference between the two -2 log-likelihood values. If the lines or planes are parallel, the observed significance level for the change should be large, since the general model does not improve the fit very much. The parallel model is adequate. You do not want to reject the null hypothesis that the lines are parallel. If you do reject the null hypothesis, it is possible that the link function selected is incorrect for the data or that the relationships (slopes or coefficients) between the independent variables and logits are not the same for all logits. In that case, a multinomial logistic regression may be appropriate. Lines are parallel when significance is >0.05. From Table 6, the significance of 0.142 is greater than 0.05, so lines are parallel. This simply means that the link function chosen is correct.

3.2.9 PARAMETER ESTIMATES

shows the information on parameter estimates. From Table 23, PF1=4 (Need for Achievement), PF3=3 (Risk of Tolerance), and HF1=3 (Entrepreneurship Education and Training) are the only significant predictors for Entrepreneurial potential (EP). With the estimate of PF1 as -0.619, it simply means that as PF1=4 increases, the probability of being in one of the higher categories decreases, or in other words, the probability of being in the lower categories increase. This explanation goes for PF3=3 and HF1=3 since they all have negative estimates (see Table 7).

Table 7. Parameter estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[EP = 2.00]	-8.404	1.375	37.386	1	0.000	-11.099	-5.710
	[EP = 3.00]	-5.641	0.945	35.600	1	0.000	-7.494	-3.788
	[EP = 4.00]	-3.332	0.887	14.119	1	0.000	-5.070	-1.594
Location	[PF1=3.00]	-0.350	0.514	0.462	1	0.497	-1.358	0.658
	[PF1=4.00]	-0.619	0.291	4.522	1	0.033	-1.190	-0.049
	[PF1=5.00]	0 ^a			0			
	[PF2=1.00]	-0.557	1.060	0.276	1	0.599	-2.636	1.521
	[PF2=2.00]	-0.774	0.828	0.875	1	0.350	-2.396	0.848
	[PF2=3.00]	-0.939	0.801	1.375	1	0.241	-2.508	0.630
	[PF2=4.00]	-0.917	0.807	1.292	1	0.256	-2.498	0.664
	[PF2=5.00]	0 ^a			0			
	[PF3=1.00]	-1.642	0.909	3.267	1	0.071	-3.423	0.139
	[PF3=2.00]	-1.015	0.839	1.465	1	0.226	-2.659	0.629
	[PF3=3.00]	-1.093	0.522	4.386	1	0.036	-2.115	-0.070
	[PF3=4.00]	-0.837	0.490	2.913	1	0.088	-1.798	0.124
	[PF3=5.00]	0 ^a			0			
[HF1=1.00]	18.672	0.000		1		18.672	18.672	

[HF1=2.00]	1.168	1.128	1.073	1	0.300	-1.042	3.378
[HF1=3.00]	-1.025	0.361	8.071	1	0.004	-1.733	-0.318
[HF1=4.00]	-0.150	0.314	0.227	1	0.634	-0.766	0.466
[HF1=5.00]	0 ^a			0			
[EF1=1.00]	-1.195	0.853	1.962	1	0.161	-2.866	0.477
[EF1=2.00]	-0.852	0.585	2.123	1	0.145	-1.999	0.294
[EF1=3.00]	-0.505	0.339	2.226	1	0.136	-1.169	0.158
[EF1=4.00]	-0.433	0.315	1.885	1	0.170	-1.050	0.185
[EF1=5.00]	0 ^a			0			
[EF2=1.00]	-2.399	1.597	2.258	1	0.133	-5.529	0.730
[EF2=2.00]	-0.470	1.101	0.182	1	0.669	-2.627	1.688
[EF2=3.00]	0.048	0.456	0.011	1	0.917	-0.846	0.941
[EF2=4.00]	-0.275	0.274	1.011	1	0.315	-0.812	0.261
[EF2=5.00]	0 ^a			0			
Link function: Complementary Log-log.							
a. This parameter is set to zero because it is redundant.							

4 CONCLUSIONS

From the ordinal regression analysis, the practical interpretation is that the “Entrepreneurial potential” of the students depends on their personality traits of “Need for achievement” and “Risk tolerance” and the human capital factor of “Entrepreneurship education and training”. Entrepreneurship education and training is the most significant predictor among the three with a p-value of 0.004. This is followed by the “need for achievement” with a p-value of 0.033, and then risk tolerance with a p-value of 0.036. In other words, the desire and ability of the students to set up their businesses are contingent firstly on the level of entrepreneurial education and training followed by their desire to achieve something meaningful for themselves, and then their ability to take risks. This means that when it comes to the entrepreneurial potential of the students, a lot must be done on the personal traits of students. Again, by extrapolation, universities must enhance their entrepreneurial formal and informal education to boost the entrepreneurial potential of students. The students must as a matter of urgency endeavor to train themselves in entrepreneurship formerly and informally, to enhance their entrepreneurial potential.

This work is consistent with the work of Zeffane [104] who also found “need for achievement” as a significant predictor of entrepreneurial potential, and that of Ahu [43] who also found that personality traits had a positive effect on entrepreneurial potential.

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APPENDIX

RESEARCH QUESTIONNAIRE

Dear respondent,

By filling out this questionnaire you participate in a study on the topic: **“Impact of personality, human capital, and environmental influences on entrepreneurial potential: a study of UPSA's final year students”**. Filling out this questionnaire will take **less than 20 minutes** of your time. We would like to express our utmost gratitude for your participation!

Kind regards,
The team

PERSONAL INFORMATION

Program of Study: ITM BA

A. PERSONALITY FACTORS

Need for Achievement-PF1

Mhango (2006):

1. I desire and pursue success
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
2. I have little fear of failure
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
3. I attribute success or failure to myself rather than to others and circumstances
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
4. I enjoy completing tasks
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
5. I return to uncompleted tasks and finish them
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
6. I put in great effort sometimes in order to learn something new
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely

Zeffane, R (2013):

7. I always do my best whether I am alone or with someone
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
8. I always try hard to improve on my past performance
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
9. I enjoy working towards clear, challenging goals
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
10. In general, I try to make every minute count
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
11. I often put pressure on myself to achieve as much as I can
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely

Locus of Control-PF2

Kristiensen and Indarti (2004):

12. If I fail on a task, I tend to give up
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
13. Diligence and hard work usually lead to success
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
14. I do not really believe in luck
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely

Risk Tolerance-PF3

Verheul et al (2006)

15. One should not start a business if there is a risk it might fail
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
16. Risk of failure is a major concern for me
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
17. I can take risks with my money, such as investing in stocks. (Hisrich & Peters, 2002)
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
18. When I travel, I tend to take new routes. (Hisrich & Peters, 2002)
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
19. I like to try new foods, new places, and totally new experiences. (Hisrich & Peters, 2002)
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
20. I will take a serious risk within the next six months. (Own thoughts)
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely

B. HUMAN CAPITAL FACTORS

Entrepreneurship Education and Training-HF1

21. In my university, students are actively encouraged to pursue their own ideas. (Autio et al., 2001)
A. Strongly Disagree B. Disagree C. Neutral D. Agree E. Strongly Agree
22. In my university, you get to meet lots of people with good ideas for a new business. (Autio et al., 2001)
A. Strongly Disagree B. Disagree C. Neutral D. Agree E. Strongly Agree
23. Entrepreneurship courses at my university prepare people well for an entrepreneurial career. (Autio et al., 1997)
A. Strongly Disagree B. Disagree C. Neutral D. Agree E. Strongly Agree
24. Entrepreneurship cannot be taught. (Autio et al., 2001)
A. Strongly Disagree B. Disagree C. Neutral D. Agree E. Strongly Agree

C. ENVIRONMENTAL FACTORS

Unemployment situation-EF1

25. I will venture into my own business because I know several graduates without jobs
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
26. I will venture into my own business because there are not enough white color jobs
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
27. I will venture into my own business because the civil service and the public sector are not employing
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely

Start-up helps-EF2

28. In my university, there is a well-functioning support infrastructure to support the start-up of new firms. (Autio et al., 2001)
A. Strongly Disagree B. Disagree C. Neutral D. Agree E. Strongly Agree
29. My family and friends will support me to start my own business. (Krueger et al., 2000)
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
30. If I became an entrepreneur, my family would consider it to be an achievement, and they will be happy. (Autio et al., 2001)
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely
31. If I became an entrepreneur, my close friends would consider it to be an achievement, and they will be happy. (Autio et al., 2001)
A. Very Unlikely B. Unlikely C. Neutral D. Likely E. Very Likely

ENTREPRENEURIAL POTENTIAL (EP)

Zeffane, R (2013):

32. I often think of starting or building a business
A. Never B. Seldom C. Sometimes D. Often E. Almost Always
33. I believe I have good leadership skills and can be an effective leader
A. Very Poor B. Poor C. Fair D. Good E. Very Good
34. I am competitive and welcome/enjoy activities that ask me to compete with others
A. Very Poor B. Poor C. Fair D. Good E. Very Good
35. I am innovative and I can find solutions to my daily challenges and problems
A. Very Poor B. Poor C. Fair D. Good E. Very Good
36. I am a hard-working person and always try my best to succeed
A. Very Poor B. Poor C. Fair D. Good E. Very Good
37. I am very good at managing money
A. Very Poor B. Poor C. Fair D. Good E. Very Good