

Mediation Moderation of Entrepreneurial Orientation, Counseling and Lifelong Learning on Socio-Cultural Factors and Career Progression of Women in Science and Technology

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Abstract

The study on the bane of women progression especially in relation to Socio-Cultural Factors, and Career Progression, entrepreneurial orientation and lifelong learning can never be overemphasized. In the 21st century, efforts by various stakeholders especially the government, nongovernmental organizations and United Nations organizations, have contributed immensely to the education and empowerment of women in Nigeria. However, the some parts of the country are still battling with the sociological factors of i.e. culture and tradition, Socio-Cultural status had been found to have influence the decision of families on whether or not to allow their female children to underwent or continue education. This has made several of the families to opt for marriage instead of further education; hence this has resulted in large number of drop outs among women. It is believed that women access to education through lifelong learning will go a long way in providing the needed avenue for their progression. This will contribute immensely to the nation's development. Another of the most dreaded menace is the level of entrepreneurial orientation and its outcome among women.

By not having empowerment through entrepreneurial education, women have suffered rapid level of divorce and broken homes. Thus counseling on the entrepreneurial mindset and empowerment, will go a long way in reducing the level of breakage in marriages. Hence the objective of this study is an empirical study on final year students on their chosen career in science and technology i.e., Zoology, Botany, Computer Science and Science Laboratory Technology. Hence the specific objective of this study is to determine the effect of Socio-Cultural Factors and Career Progression of Women in Science and Technology: The Role of Entrepreneurial Orientation, Counseling and Lifelong Learning. A quantitative method of study was conducted with the use of a quantitative questionnaire. The findings of the study are found to be beneficial to both theory and practice.

Keywords: *Entrepreneurial Orientation, Lifelong Learning, Socio-cultural Factors, Career Progression*

1.1 INTRODUCTION

The study on women career choice and their advancement to greater heights can never be overemphasized, as women are today found to engage in several professions and other related fields of endeavor in search of self-reliance and empowerment. As a result of the influx of women in to paid jobs and or skilled occupations, women have increase in their pursuit to pursue education and training in even disciplines that are believed to be more of men than women. It is observed that today, women were found world over to have increase in population, level of education, and attain higher positions in various countries around the world. In Nigeria, statistics had shown that the increase in population of women, had increased tremendously, to which it accounts for almost half of the country's population. Women are found to have participated or work in various sectors of the economy which includes but not limited to, manufacturing, agriculture, business and service organizations, to mention but a few. Consequently, they are faced with their traditional duty of taking care of the family domestically which is equally seen as an unpaid aspect of their work. The increase of women population in the country is a welcome development; however, the increase did not tally with the required size of their participation in labored jobs or empowerment drive of the nation's economy. Gómez, Suárez, Ruiz AandRincón (2021) observed that, on socio-cultural factors, the world is increasingly becoming more globalized and turning into a multicultural world, hence societies have a direct link with its environment which in turn, influences major decisions taken, especially that of the family. Cultures are highly transmitted to children, which in turn influence their way life and all decisions they take in their day to day activities. Furthermore, according to Dosunmu, Dichaba and Adeyemo (2020), the influx of women in science and technology is in the increase in Nigeria, however, the societal culture negates the usage of the certificate.

Even though women in the past were everywhere in the nation's workforce, they are not mostly found in the technical aspects of the economy i.e. agriculture, engineering and science related fields. This can be attributed to several factors within the context of the society at which we live. Factors such as work-family balance, national culture of masculinity and feminist, glass ceiling, stereotype, to mention a few. In addition, women access to education had been found to be a panacea to their advancement (George, Fagbohun, Olonade, and Aderoju, 2018). Despite the challenges women faced in especially specialized areas, women are today found to enroll into related science and technology fields like botany, zoology, computer science and engineering and science laboratory technology. This new trend has made many of them to train in science related areas. However, their ability to achieve their dream or reaching their desired goal is cut short due to some organizational, societal, domestic and or masculinity feminist situations. In some societies in some parts of the country, women were cut short of their dreams as a result family-work imbalance, thus women are left to do away with their science and technology training. In some cases, women are seen within the context of the society as house wife material, as such they are not allowed to engage in any form of empowerment drive. In some, gender stereotyping and glass ceiling are the common phenomenon, as women are seen as not belonging to the profession i.e. engineering and many of its related disciplines.

The trend in the increase of women in paid jobs or private businesses is not only peculiar to Nigeria a lone, as many countries have step up to the challenge since some decades ago. The United Kingdom for example, tried or attempted to bridge the gap of gender imbalance in the

country, especially in the area of engineering, which in turn gave rise to the Women into Science and Engineering (WISE) campaign established in 1984. In the United States, the National Science board promotes the inclusion of women in science related fields. In the same vein, the European commission equally borrowed a leaf by promoting the campaign on women empowerment and equality. In Malaysia, the government had continued to promote the inclusion of women in science and engineering and results had been very impressive. Lifelong learning has today been found to have provided an enabling environment to the perspective of women empowerment in recent times. This is attach to especially, developing nations whom it is believed is still have issues with socioeconomic environmental issues (Dosunmu, Dichaba and Adeyemo, 2020), thus this approach had gone a long way in improving adult literacy level, for especially married women. Researchers have shown, UNESCO had introduced the lifelong learning initiative in Africa and its working towards especially women, however, researches in this area is limited.

This study is therefore on the impact of Socio-Cultural Factors and Career Progression of Women in Science and Technology: The Role of Entrepreneurial Orientation, counseling and Lifelong Learning. The focus of this study is on female students at the final year of their study in the class of science laboratory technology, biological science and public health.

1.2 Statement of the Problem

The national culture of a given society had a major strength in the societal environment, which expresses direct or indirect discrimination, i.e. masculinity and or feminist (Baruch & Reis, 2015). National culture had a great impact on the behavior of a given society, thus the roles of individuals in the society, norms and values are directly associated with social behavior inherent in men and women based on their country's national culture (Unite, Parry, Briscoe, & Chudzikowski, 2016). The said expectations were found to have a greater on individual career experience and form how the behavior is conceived (Jáuregui1 and Olivos1, 2018). In the past, the socio-cultural barrier of a given setting had led to the discrimination against females, however, due to the ever accelerating change, the society had realized the need to train their daughters by supporting them to have a successful career (Patwardhan, 2016). One other major factor that hinders women progression is the career guidance in the educational approach (Gómez et al 2021), hence counseling had been found to impact positively on the career choice of female students, however, the near absence of such openings have made females to drop out of school and be discouraged from continued learning. In Nigeria, especially the northern part of the country, women are mostly married before or immediately after they obtain a certificate of education i.e., secondary level certificate or higher level certificate of Bsc or HND certificate (Dosunmu et al, 2020), to this end, most of this level education is in some cases lost, as women get married and become house wives. One of the areas that can put a hold on this menace is the lifelong learning initiative.

Although the effects of institutional culture on the retention and recruitment of women into engineering had been considered in past researches, their position and involvement had not been considered (Hersh, 2000, Jáuregui1 and Olivos1, 2018), Hersh observed that the technical work force in most industrialized countries around the world today is aging coupled with the increased reduction on interest in science and engineering among the youths. It was further observed that although women and minorities are expected to the expected shortfall, many nations are not in any way closer to achieving the needed critical mass of women into the engineering profession.

Although there is tremendous increase of women participation in education owing to the support from various stakeholders, they are yet to reach their full potential, as a result of another major factor which is socio-cultural factors (Dosunmu et al 2020). Socio-cultural factors are the form of cultural or religious belief practices, which some have hindered women from attaining or having equal access to education, especially in the north. This is observed to have forced women into early marriage. However, this is divine based on the teachings of the religion. Furthermore, Chinwokwu, and Arop (2018) observed that, of recent, the situation is changing gradually due to enlightenment, however, immediately women got married, certain socio-cultural belief, still hinder their progression, especially in the area of work family balance.

As earlier highlighted in the background of the study, it is on this that this study intends to empirically test the respondents on the impact and effect of Socio-Cultural Factors, and Career Progression of Women in Science and Technology: The Role of Entrepreneurial Counseling and Lifelong Learning. The focus of this study is on female students at the final year of their study in the class of science laboratory technology, biological science and public health. The main research objective of this study is the empirically testing of respondents on the Impact and Effect of Socio-Cultural Factors, and Career Progression of Women in Science and Technology: The Role of Entrepreneurial Orientation, Counseling and Lifelong Learning

2.0 LITERATURE REVIEW

2.1 Socio-Cultural Factors

Socioeconomic status had been found to have influence the decision of families on whether or not to allow their female children to underwent or continue education. This has made several of the families to opt for marriage instead of further education; hence this has resulted in large number of drop outs among women in the north. It is believed that women access to education through lifelong learning will go a long way in providing the needed avenue for their progression. This will contribute immensely to the nation's development. Another of the most dreaded menace is the level of entrepreneurial orientation and its outcome among women. By not having empowerment through entrepreneurial education, women have suffered rapid level of divorce especially in northern Nigeria. Thus counseling on the entrepreneurial mindset and empowerment, will go a long way in reducing the level of breakage in marriages.

Although there is tremendous increase of women participation in education owing to the support from various stakeholders, they are yet to reach their full potential, as a result of another major factor which is socio-cultural factors (Dosunmu et al 2020). Socio-cultural factors are the form of cultural or religious belief practices, which some have hindered women from attaining or having equal access to education, especially in the north. This is observed to have forced women into early marriage. However, this is divine based on the teachings of the religion. Furthermore, Chinwokwu, and Arop (2018) observed that, of recent, the situation is changing gradually due to enlightenment, however, immediately women got married, certain socio-cultural belief, still hinder their progression, especially in the area of work family balance.

Motivation had been found to be the driving force of all the actions of individuals, as the individuals needs and their desires have a very strong effect on their given behavior (Rani and Reddy, 2019). A measure difficulty in the field of management and psychology in relation to motivation is the lack of consensus definition. Motivation is an indeed broad and complex concept, however, organizational scientists have agreed on its basic characteristics as “a set of

processes that arouse, direct and maintain human behaviour towards attaining a desired goal". Hence Motivation is concerned with how behaviour gets started, energized, sustained, directed, stopped, and what kind of subjective reaction is present in the organism while this action is going on. Motivation therefore seems to be the internal condition which stimulates directs and maintains behavior (Day and Allen, 2004, Byrne, 2008; Upadhyay and Tiwari, 2009; Pany, 2014; Maheswari and Aruna, 2016; Anitha and Jebaseelan, 2018; Devakumar, 2018; Rani and Reddy, 2019). Furthermore, it refers to the forces within a person that affect his or her direction, intensity and persistence of voluntary behaviour.

According to the expectancy-valence theory of motivation (Vroom, 1964), people are motivated to put forth effort if they expect that the effort will lead to good performance and that the effort will be instrumental in attaining valued outcomes (Kattzell & Thompson, 1990). When applied to work settings, expectancy valence theory suggest that employees put forth more effort in performing their job tasks if they believe that the good performance will result in both intrinsic and extrinsic rewards. Past researchers have tested the expectancy-valence theory by examining such variables such as number of hours worked and work centrality to represent effort and expected salary and promotions to represent desired outcomes. For example Whitely et al (1991) measured work motivation by three variables i.e., average number of hours worked per week, expected future outcome and work centrality. In their study, two of the motivational variables, average hours worked per week and future outcome were positively related to compensation. Maslow posits that when the need for love and belongingness are met, an individual can then focus on the higher level of need of intellectual achievement (Woolfolk, 2004), hence increasing the urge to learn.

Another variable which may represent an employee's motivation is career planning. The career planning model suggests that planning career goals leads to implementation of career goals which in turn leads to attainment of career goals. A basic premise of the model is that career plans are a form of goal setting. Based on the psychological success model, goal setting leads to increased effort expenditure in other to attain the goals. Thus career planning should be followed by efforts to increase the plans or increase motivation. These efforts in turn lead to higher career performance and career involvement. Gould (1979) found that career planning was positively related to salary and career involvement. Aryee and Yaw (1993) and Wayne et al (1999) found further support for the career planning model. Yet, other studies define career motivation associated with wide range of decisions and behaviors related to one's career.

For example, London (1983), Day and Allen (2004) described career motivation as multidimensional, reflective of an individual's career identity, career insight and career resilience. Career identity is the extent that one defines oneself by one's work. It is associated with job, organizational and professional involvement, need for advancement and recognition. Career insight is the ability to be realistic about one's career and consists of establishing clear, feasible career goals and realizing one's strengths and weaknesses. Career resilience is the ability to adapt to changing circumstances, even when circumstances are discouraging or disruptive. It consists of characteristics such as belief in self, willingness to take risk and need for achievement.

To promote career motivation, employees should be given positive reinforcement for good performance, more opportunities for achievement and input, and receive support for skill development (London & Bay, 1984). Day and Allen (2004) found support that high career

motivation may translate into higher performance level that leads to career success. Byrne et al (2008) also found that those who are high in career motivation do indeed experience greater career success. Upadhyay and Tiwari (2009) in a study evaluated the effect of academic majors on motivation of students, they found that science students significantly have higher achievement motivation as compared to social science and other related majors. Pany (2014) in a study on motivation found that there is significant difference between male and female art and science students motivation levels. In relation to career choice and motivation, it can be said that science students are more motivated than the arts students. Maheswari and Aruna (2016) found that there exist differences in motivation in relation to the career of male and female gender, as significant differences between the genders are found.

Anitha and Jebaseelan (2018) found there is a significant difference between the gender and the overall achievement motivation score. Concerning the dimensions, there is high significant difference between the gender and the Academic motivation, importance of Grade and marks, meaningfulness of tasks, Attitude towards education and teacher, interpersonal relation and the gender (male or female). And girls are highly motivated than boys in academics. Devakumar (2018) studied gender differences in achievement motivation and academic self-concept of SSC board students. It was found that there was significant difference in achievement motivation scores where the girls scored higher than the boys. Finally, Pretty and Reddy (2019) found a clear difference between the achievement motivation of sciences and arts stream students and achievement motivation among male and female college students.

2.2 Women Career Advancements

Studies in the past had highlighted those factors that led to career advancements, and went further to suggest measures aimed at special needs for women (Doherty, 2004; Mooney, 2007; Boone, 2013; Baum, 2013; Baum, 2015). Informal interactions by managers is of paramount importance and essential in building cooperation, trust, shared knowledge and understanding, as the advantages of informal interactions goes a long way in developing networking and mentorship relationships. Individual qualities such as attitude, leadership skills, communication skills, job knowledge, pro-activeness, personality, ability to create identity are necessary skills that are required for an individual to achieve his or her organizational attainment. Equally important is the accumulation of human capital and social capital such as managerial skills, mobility, coaching and mentoring, work environment, which forms organizational factors in other to succeed in the organization Mckinsey (2014).

In a related study, Whittock (2002) applied Kanter's (1977) tokenism framework to her research by examining women's involvement in manual trades. Whittock assumes that there exist two ways in which tokens respond to the issue of boundary heightening. It is either they accept being isolated and risk being excluded from socializing or the idea of sometimes being in the political activity of attempting to be an insider thus addressed as one of the boys. The result of this study found reveals that some of the women based on the interview conducted, appeared to relish their token image or status coupled with the heightened visibility that accords it. Furthermore, Whittock proposes that there are two ways in which tokens can respond to boundary heightening i.e. accepting isolation, which risks exclusion from socialization, and sometimes, political activity and attempting to become an insider (or "one of the boys").

Broadbridge (2008) identified determination, attitude, interpersonal skills, performance and networking, role models and mentoring as factors that assist women careers. Chen (2011) found that such personal factor as personality, physical traits, capability and family, and also organizational structure and social culture, affects women careers and job satisfaction. Ronen and Pines (2008) in their study, investigated the gender differences in burnout, coping style and peer support available among high-tech engineers. By conducting a longitudinal study, they consider an interesting occupational group based on a gender perspective. This is because of the fact that the engineering profession culture is considered masculine thus it has an image of many prejudices against women. They argued that the combination of the prejudices and the masculine culture of the engineering profession all combined to explain the paucity and the level of burnout among women engineers. They found support for their prediction as it was found that women engineers were found to report higher level of burnout than their male counterparts. Women experience lower level of coping strategy and at the same time struggle with smaller opportunity for peer support and also work-family conflict.

In a related study, Ismail and Ibrahim (2008) investigated the barriers women faced in their pursuit for the attainment to higher positions in a Malaysian oil company. Using the gender role theory, they hypothesized based on the theory's assumption that women are generally viewed and treated in unfavorable manner when they were found not have acted in their gender roles they were expected. They obtained their data from a sample that consist of seventy eight executive women within the Malaysian oil company. The findings were that family structure and women commitment were found to have been the most significant barriers to women career progression. Furthermore, they reported that women were found to have no difference in terms of their perception on the barriers they face among various job positions.

Thurasamy, Lo, Amri and Noor (2011) conducted their study by noting the presence of inequality in gender and career advancement, and also the tenure of service among engineers that were employed in the Malaysian manufacturing organizations within the Northern peninsular. The study considers such variables as gender, supervisors support and tenure on objective and perceived career advancement. They also consider the moderating effect of some demographic variables. They identified a total number of 158 engineers within ten multinational manufacturing organizations. Consequently, their result shows that variables such as the gender, supervisors support and service tenure were found to have significantly related to career advancement. Women engineers in this study were found to be subjected to some form of problem of performance, pressure, stereotyping and social isolation in the male dominated occupations such as engineering.

Yet-Mee, Luen and Chan, (2013), examined the barriers that hinder women advancement in organizations in a Malaysian manufacturing industry. They examine such variables as work-life balance, networking, mentoring support, and training and development. The result of the study shows that only work-life balance is found to predict barrier to women's career advancement in organizations. In the same vein, Nzioka (2013) found that attitude, educational qualifications, career goals and personality are important personal factors that affect general manager's perception of career advancement of women managers in Kenyan hotels. In a study involving women in the hotel industry, Patwardhan, Mayya and Joshi (2016) conducted a study on the issues that relates to the career advancement of women managers from the perspective of male managers. Factors such as attitude, leadership skills and communications skills are found to be

of prominent important towards the advancement of women in their careers. Equally important is the finding that those dimensions of career pathway such as gender stereotyping, social structure and culture, gender inequality, gaining social capital, and double bind and human resource strategies adopted by the organization, supports the career advancement of women. However, they found that the utmost barriers to women managers' advancement to leadership positions are more of family responsibilities, flexibility in work solutions and gender stereotyping against women.

In an in-depth interview, Jáuregui¹ and Olivos¹ (2018) conducted a study on the challenges faced by women in Peruvian organizations. The result shows that those factors as physical mobility, educational attainment, professional experience and informal networks are found to hamper women advancement. Equally, the nation's cultural pattern of business which is dominated by men recognizes women to be responsible in attending to family issues and taking care of children. Hassan 2019 found that issues such as Socio-cultural factor through patriarchy, domestic chores, early marriage, role-stereotype and gender discrimination hinders the career advancement of female academic staff in Nigeria. Dosunmu, Dichaba and Adeyemo (2020), found that this is attach to especially, developing nations whom it is believed is still have issues with socioeconomic environmental issues. Gómez, Suárez, Ruiz and Rincón (2021) observed that, on socio-cultural factors, the world is increasingly becoming more globalized and turning into a multicultural world, thus Dosunmu, Dichaba and Adeyemo (2020), observed that influx of women in science and technology is in the increase in Nigeria, however, the societal culture negates the usage of the certificate.

2.3 Research Hypothesis

Based on the problem statement that outlines the research gap and the suggestion for future studies. Socio-cultural Factors in this study is the independent variable of the study. The women career advancement is the dependent variable. Entrepreneurial orientation, Counseling, Lifelong learning are considered both as mediating and moderating variables in the study. Hence the following specific hypothesis:

- H1:** Socio-Cultural Factors are significantly related to Women Career Progression.
- H2:** Entrepreneurial Orientation mediates the relationship between Socio-Cultural Factors and Women Career Progression
- H3:** Counseling mediates the relationship between Socio-Cultural Factors and Women Career Progression
- H4:** Lifelong Learning mediates the relationship between Socio-Cultural Factors and Women Career Progression
- H5:** Entrepreneurial Orientation moderates the relationship between Socio-Cultural Factors and Women Career Progression
- H6:** Counseling moderates the relationship between Socio-Cultural Factors and Women Career Progression
- H7:** Lifelong Learning moderates the relationship between Socio-Cultural Factors and Women Career Progression

Theoretical Underpinning

Joseph Schumpeter Theory of Innovation

Innovation stems from romance word: “Innovare” that mean is doing new and different thing (Hobikoğlu, 2009). Scientifically, story of innovation dates back to 1912, when J. A. Schumpeter published a book named ‘Theory of Economic Development’. In this book innovation was described as inventiveness in basic meaning. Schumpeter disintegrated innovation to three stage; *Invention*: Discovery process of a new technical discipline, *Innovation*: Process of commercialization of new invent and, *Diffusion*: Diffusing of innovation in commercial using. Joseph Schumpeter is an American; he is an economist whose view and theory is based on the economic development of various nations. He maintains that entrepreneurship is not a function of social, cultural, or religious factors but of individual motivated by the will to achieve power. Schumpeter believes that, the desire to achieve power drives an individual into an entrepreneurial pursuit. He believes that to achieve this, the entrepreneur must achieve the trait to forecast with certain degree of accuracy. Such entrepreneur must be able to overcome fixed habits and thoughts and develop the capacity to withstand social ills.

According to Schumpeter, though ethics is important in business but its strict adherence should not prevent the entrepreneur from venturing into a business that is considered profitable as long as he has not broken the law. He must develop the energy of will and mind to overcome fixed habits of thoughts. Joseph Schumpeter propounded the well-known innovative theory of entrepreneurship. Schumpeter takes the case of a capitalist closed economy which is in stationary circular flow of the economy by introducing an innovation and takes the economy to a new level of development. The activities of the entrepreneur represent a situation of disequilibrium as their activities break the routine circular flow. Innovation of entrepreneur is responsible for the rapid economic development of any country. Taking about innovation, he referred to new combination of the factors of production; Schumpeter had assigned the role innovator to the entrepreneur, who is not a man of ordinary managerial ability, but one who introduce something entirely new.

3.0 METHODOLOGY

3.1 Research Design

This study therefore, used the empirical study on science related courses i.e. Zoology, Botany, Computer Science and Science Laboratory Technology. The empirical study was conducted through the use of study questionnaire to test their perception, ability or willingness to succeed in their chosen field or career. This study uses a descriptive and correlation type of survey design through questionnaire. This type of design is considered suitable for collecting primary data. Descriptive types of studies are usually undertaken in organizations so as to learn about or describe characteristics of a group (Sekaran&Baugie, 2009). It is also undertaken to understand the characteristics of organizations that follow common practice. Survey research can be seen as one of the methods of gathering primary data designed in a form of communication with the representative or sample of a given target population (Zikmund, 2003). Hence, survey research is primary data that is gathered and assembled specifically for the research project at hand.

3.2 Population of the study

A population of a study refers to the entire group of people chosen to be the focus of the study, events or things that are of interest to the researcher and which he wishes to investigate (Sekaran & Baugie, 2009). A population is a complete group of entities sharing some common set of characteristics (Zikmund, 2010). The population of this study comprises the final year students

of all the science departments in Bauchi State University Gadau, with their departments that cut across the faculties of science and Basic Medical Science.

3.3 Unit of Analysis

The unit of analysis in this study is individual unit of analysis; hence, individual students were considered the unit of analysis of this study. The individual students are chosen due to how Bandura (1997) defines self-efficacy as one's belief in one's capabilities to organize and execute the courses required to produce given attainments.

3.4 The Research Sample

This refers to the process of selecting a smaller number of some items or some part of a larger population in order to make conclusions about the whole of this population (Zikmund, 2010). A sample is a subject that represents populations as it comprises some members who are selected from the population; thus' it is a group that represents the population under study (Sekaran&Baugie, 2009). Sampling is sufficiently accurate and reliable if properly selected. It also aids budget and time constraints (Zikmund, 2010).

3.4.1 Sampling Technique

This study uses the probability sampling technique. According to Sekaran (2003), probability sampling gives each respondent equal chance of being chosen as a sample. For this purpose, stratified sampling will be adopted. Haunt and Tyrrell (2004) stated that in a stratified sample, the sampling frame is divided into non-overlapping groups or strata. A sample is drawn from each stratum which would give a clearer representation leaving no stone unturned. This study uses probability sampling in other as to give equal opportunity for each member of the population to be chosen.

3.5 Data Collection Method

The approach is the empirical study of interacting with the study sample through their perception, ability or willingness to succeed in their chosen field or career. This study uses a descriptive and correlation type of survey design. This type of design is considered suitable for collecting primary data. Descriptive type of studies are usually undertaken so as to learn about or describe characteristics of a group, i.e. age, level of education, job status or years of service (Sekaran&Baugie, 2009). It is also undertaken to understand the characteristics of organizations or area of endeavor that follow common practice. Survey research can be seen as one of the methods of gathering primary data designed in a form of communication with the representative or sample of a given target population (Zikmund, 2003). On this, this study developed a methodology based on empirical study on some selected fields of science and technology.

3.6 Study Questionnaire

This study uses the questionnaire form of data collection. This is an instrument that is considered suitable for the collection of quantitative data. As it is usually designed in the form of questionnaire, it enables and gives the respondents the opportunity to share how they feel about the variables under study, thereby giving room to examine their feelings on the variables under study. The questionnaire is designed to measure attitudes which also allow respondents to give an indication of how they strongly agree or disagree with statements that are made, based on the ranges of positive to negative rating on an attitudinal object (Zikmund, 2010). A face-to-face method of questionnaire distribution was adopted as the researcher was on the field to distribute the questionnaire first hand to the respondents. Based on the research sample, the face-to-face distribution of the questionnaire was conducted with the help of two research assistants. To this

end, the questionnaires were delivered to the respondents and they were given time to respond. In some cases, some follow up phone calls were made to the respondents. Completed questionnaires were then collected after three weeks of distribution stages.

3.6.1 Content and face validity

Sekaran and Bougie (2010) observed that content validity entails the idea of making some form of consultation to a small sample of the typical respondents to the instruments in order to make some judgment on the suitability or otherwise of those items that are meant to measure the construct. This will enable the study to ensure all the measures consist of measures that represent those set of items that is meant to measure the exact variable. In line with this suggestion, the questionnaire was drafted and first distributed to experts in the organizational behavior and leadership area in order to get feedback on the suitability, content and the richness of the questionnaire. Furthermore, stakeholders who are familiar with the context of the study were also contacted. In this aspect, some comments were observed i.e. avoid lengthy statements, avoid double barrel questions, some items look similar and the issue of so many questions was considered alongside other suggestions. Hence, the questionnaire was redesigned to suit the observations.

3.6.2 Reliability Test

The reliability test was conducted to check the internal consistency of the variables under study at this stage. This is done to make sure the items hang together as a set that is capable of measuring the same concept by correlating with each other. Sekaran and Bougie (2010) submitted that the most popular among the tests for inter-item consistency of reliability is the Cronbach Alpha coefficient. This study therefore employed the Cronbach Alpha coefficient. They further recommend that a Cronbach Alpha coefficient with a benchmark of .60 is accepted to have an average reliability. In order as to test the reliability of the items considered in this study before the actual study, a total number of forty questionnaires were distributed. Page et al. (2007) recommended that a population of thirty respondents or more can be considered enough for a pre-test; hence, these numbers of questionnaires were sent. According to Nunally and Bernstein (1994), a Cronbach alpha value of above .60 acceptable, thus this value is found suitable.

3.7 Data Analysis Method

This study uses the PLS/SEM software version for the purpose of the analysis and hypothesis testing. In this case, several statistical tools/techniques were performed in the analysis.

3.7.1 Correlations analysis

A Pearson correlation analysis was conducted to examine the correlation among the variables of this study. Correlation analysis is also conducted to see the covariation among the study variables. In the course of conducting this analysis, a careful preliminary analysis was considered in order to look at the violation of the assumptions of linearity, normality and homoscedasticity. For the purpose of a behavioral research of this nature, scholars have proffered that correlation coefficient of 10, 30, and 50 irrespective of the nature of the sign, are allowed as they further interpret it to be ranging from small, medium and large coefficients (Hair et al., 2010) thus, the presence of a very high significance, i.e. .90 is considered to have an element or likely existence of multicollinearity.

3.7.2 Regression analysis

Regression analysis was used to test the hypothesis that investigates the relationship among the predictor and the criterion variables of this study. In the first place, an issue was considered before the regression analysis is conducted. The issue is that both the predictor and criterion variables will be measured based on continuous scale which is deemed appropriate. According to Hair et al. (2010), there are four underlying assumptions as to the test for regression analysis. This includes the test for the assumptions in terms of linearity, normality, homoscedasticity and the independence of the residuals, which are to be examined through the residual scatter plots and the normality probability plot in the regression standardized residuals.

4.0 DATA ANALYSIS

4.1 Regression Analysis

The objectives of this study is whether Entrepreneurial Orientation, Counseling and Lifelong Learning Mediate/Moderate the Impact/Effect of Socio-Cultural Factors and Career Progression of Women in Science and Technology. On this, hypothesis was formulated as to *whether Entrepreneurial Orientation, Counseling and Lifelong Learning Mediate/Moderate the Impact/Effect of Socio-Cultural Factors and Career Progression of Women*. The aim of this is to ascertain the level of the women's perception on whether Socio-Cultural Factors influence their Career Progression. Regression analysis was done to test this hypothesis. Socio-Cultural Factors was regressed on overall Career Progression of Women, alongside the Mediation/Moderation test of Entrepreneurial Orientation, Counseling and Lifelong Learning.

Table 1: R-square

	R-square	R-square adjusted
WCA	0.827	0.811

Coefficient of determination is measured on the value of R Square Adjusted. The total effect of the independent variables of the study on the dependent variable (WCA) is 0.811, which means 81.1% of the variation in R-square adjusted is as a result of change in independent variables. Thus, independent variables are substantial predictors of WCA (Hair, et al., 2014).

Table 2: Construct Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CO	0.791	0.801	0.863	0.612
CS	0.791	0.810	0.862	0.610
EO	0.818	0.829	0.872	0.578
EP	0.862	0.870	0.896	0.590
LF	0.727	0.729	0.830	0.550
LL	0.727	0.730	0.830	0.550
SCF	0.819	0.838	0.871	0.574
WCA	0.845	0.849	0.890	0.618

Table 2 shows Loading of the items and the reliability coefficients in the forms of Cronbach's Alpha and Composite Reliability of above 0.70 for all the constructs. Therefore, all the coefficients have met the accepted threshold for research (Hair, et al., 2014; Cortina, 1993). Also the convergent validity on the same Table xx appeared within the accepted threshold of 0.5. (Bougie, 2012). The AVEs for all the constructs are above 0.5. Thus, the data fit in the theoretical underpinning about all the constructs.

Table 3: Discriminant validity

Heterotrait-monotrait ratio (HTMT) – Matrix

	CO	CS	EO	EP	LF	LL	SCF	WCA	EP x SCF	CS x SCF	LF
	0.759										
	0.779	0.779									
	0.752	0.752	0.512								
	0.819	0.819	0.632	0.619							
	0.774	0.774	0.619	0.575	0.816						
	0.352	0.352	0.212	0.202	0.282	0.238					
	0.647	0.647	0.498	0.416	0.674	0.669	0.295				
CF	0.124	0.124	0.146	0.198	0.121	0.114	0.093	0.138			
CF	0.078	0.078	0.042	0.116	0.042	0.045	0.348	0.039	0.573		
CF	0.052	0.052	0.048	0.098	0.044	0.043	0.239	0.120	0.599	0.737	

The HTMT ratios of the constructs on Table 3 are all below 0.85. Therefore, discriminant validity requirement of HTMT is met

Table 4:

	Beta	T Statistics	P Values
SCF -> WCA	0.467	8.210	0.000
SCF ->CO -> WCA	0.063	3.124	0.002
SCF ->LL ->WCA	0.052	2.760	0.006
SCF -> EO ->WCA	0.038	1.968	0.047
EP x SCF ->WCA	0.140	3.770	0.000
CS x SCF ->WCA	0.340	5.672	0.000
LF x SCF ->WCA	0.440	7.631	0.000

Table 4 shows a significant positive result (β : 0.467, t-stat: 8.210 & p-value < 0.05) for socio-cultural factors and women career progression (SCF -> WCA). Therefore, the first hypothesis (**H₁**) which stated that there is significant relationship between socio-cultural factors and women career progressions accepted. Table 4 shows a mediation (SCF -> CO -> WCA: β : 0.063, t-stat: 3.124 & p-value < 0.05) about entrepreneurial orientation mediation in the relationship between socio-cultural factors, and women career progression. Therefore, the second hypothesis (**H₂**) which stated that entrepreneurial orientation has significant mediating effect in the relationship

between socio-cultural factors, and women career progression is accepted. The *Table 4* shows of a mediation (SCF \rightarrow LL \rightarrow WCA: β : 0.052, t-stat: 2.760 & p-value $<$ 0.05) about mediation of Counseling in the relationship between Socio-Cultural Factors and Women Career Progression. Thus, the third hypothesis (**H₃**) which stated that Counseling mediates the relationship between Socio-Cultural Factors and Women Career Progression is accepted.

The same *Table 4* shows an absent of mediation (SCF \rightarrow EO \rightarrow WCA: β : 0.038, t-stat: 1.968 & p-value $<$ 0.05) of Lifelong Learning mediation in the relationship between Socio-Cultural Factors, and Women Career Progression. For this, the fourth hypothesis (**H₄**) which stated that Lifelong Learning mediates the relationship between Socio-Cultural Factors, and Women Career Progression is accepted. *Table 4* shows a moderation (EP \times SCF \rightarrow WCA: β : 0.140, t-stat: 3.770 & p-value $<$ 0.05) of Entrepreneurial Orientation on the relationship between Socio-Cultural Factors, and Women Career Progression. Therefore, the fifth hypothesis (**H₅**) which stated that Entrepreneurial Orientation moderates the relationship between Socio-Cultural Factors, and Women Career Progression is accepted. The *Table 4* shows of a moderation (CS \times SCF \rightarrow WCA: β : 0.340, t-stat: 5.672 & p-value 0.05) of Counseling on the relationship between Socio-Cultural Factors, and Women Career Progression. Thus, the sixth hypothesis (**H₆**) which stated that Counseling moderates the relationship between Socio-Cultural Factors, and Women Career Progression is accepted. The same *Table 4* shows a moderation (LO \rightarrow IO \rightarrow SP: β : 0.440, t-stat: 7.631 & p-value $<$ 0.05) of Lifelong Learning on the relationship between Socio-Cultural Factors, and Women Career Progression. For this, the seventh hypothesis (**H₇**) which stated that Lifelong Learning moderates the relationship between Socio-Cultural Factors, and Women Career Progression is accepted.

5.0 DISCUSSIONS, CONCLUSION, AND RESEARCH IMPLICATION

5.1 Discussions

The result of the regression analysis supported the hypothesis that *Socio-Cultural Factors significantly influences Career Progression of Women*. Coefficient of determination is measured on the value of R Square Adjusted. The total effect of the independent variables of the study on the dependent variable (WCA) is 0.811, which means 81.1% of the variation in R-square adjusted is as a result of change in independent variables. Thus, independent variables are substantial predictors of WCA (Hair, et al., 2014). As can be seen from the result of the regression analysis, the relationship between Socio-Cultural Factors and Career Progression of Women were found to be significant. It is therefore also found that the hypothesis of this study is supported. Equally, Entrepreneurial Orientation, Counseling and Lifelong Learning has significant mediating effect in the relationship between socio-cultural factors, and women career progression, hence the entire hypothesis are accepted. In the same vein, Entrepreneurial Orientation, Counseling and Lifelong Learning has significant moderating effect on the relationship between socio-cultural factors, and women career progression, hence all the hypothesis are accepted.

Studies in the past had highlighted those factors that led to career advancements, and went further to suggest measures aimed at special needs for women (Doherty, 2004; Mooney, 2007; Boone, 2013; Baum, 2013; Baum, 2015; Jáuregui and Olivos (2018); George, Fagbohun, Olonade, and Aderoju (2018); Dosunmu, Dichaba and Adeyemo (2020); Gómez, Suárez, Ruiz AandRincón (2021). These findings are in concord with the findings of past studies, i.e. Yet-

Mee, Luen and Chan, (2013), shows that work-life balance is found to predict barrier to women's career advancement in organizations. In the same vein, Nzioka (2013) found that attitude, educational qualifications, career goals and personality are important personal factors that affect general manager's perception of career advancement of women managers in Kenyan hotels. Patwardhan, Mayya and Joshi (2016) found that attitude, leadership skills and communications skills are found to be of prominent important towards the advancement of women in their careers. Equally important is the finding that those dimensions of career pathway such as gender stereotyping, social structure and culture, gender inequality, gaining social capital, and double bind and human resource strategies adopted by the organization, supports the career advancement of women. However, they found that the utmost barriers to women managers' advancement to leadership positions are more of family responsibilities, flexibility in work solutions and gender stereotyping against women.

Jáuregui¹ and Olivos¹ (2018) reported that physical mobility, educational attainment, professional experience and informal networks are found to hamper women advancement. George, Fagbohun, Olonade, and Aderoju (2018) found that factors such as work-family balance, national culture of masculinity and feminist, glass ceiling, stereotype, access to education had been found to be a panacea to women advancement. Socio-cultural factor through patriarchy, domestic chores, early marriage, role-stereotype and gender discrimination were found to hinder the career advancement of women (Hassan 2019). Dosunmu, Dichaba and Adeyemo (2020), found that this is attach to especially, developing nations whom it is believed is still have issues with socioeconomic environmental issues. Gómez, Suárez, Ruiz AandRincón (2021) observed that, on socio-cultural factors, the world is increasingly becoming more globalized and turning into a multicultural world, thus Dosunmu, Dichaba and Adeyemo (2020), observed that influx of women in science and technology is in the increase in Nigeria, however, the societal culture negates the usage of the certificate.

Implications for Practice

As a result of the rapid change in the pattern of workforce, researches in the area of career advancement is increasingly becoming to consider those differences that exist between different group of workers in relation to what determines their success. This can be to some extent as a result of the rapid increase in the proportion of women entering the workforce, thus prompting researchers to consider what exactly determines their advancement. Even though women make up more than 36 percent of the Nigerian labor force, not many of them are in the technical fields such as engineering and science related fields. Given the substantial contribution of these technical fields in today's modern economy, the rapid expansion of employment opportunities and high wages in the engineering and sciences, the scarcity of women in these areas is still puzzling especially from an academic perspective.

The empirical study has gone a long way in developing the mindset of the participants to believe, have on the job training, and be convinced on their self-efficacy to choose their career and advance to greater heights. The insights from this study will go a long way in proffering possible solutions to the menace of socio-cultural factors on women advancement, especially with the intervention of entrepreneurial orientation and lifelong learning. Thus the output of the study will surely guide the policy makers and shaping the menace of women divorce and out of school challenges.

This study will impact the society in different ways, i.e.

1. The national policy on gender relations and women empowerment
2. The national policy on entrepreneurship education as it will help shape the curriculum and method of delivery in entrepreneurship education to especially women.
3. The study will give inputs and recommendations to theory and practice.

Recommendations for future researchers

The finding of this study has gone a long way in highlighting the factors that needs consideration in woman advancement. Future studies might be replicated in other study setting, organizations, geographical zones and or countries around the world. other equally important variables such as socio-economic factors, family work balance, child care support, women occupational self-efficacy, person job fit, to mention a few might be considered in this framework, to give further insights on the need for women advancement in organisations.

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