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Skill Acquisition in Business Education for Combating Unemployment in Rivers State

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Abstract

Unemployment has become an issue of major concern in different countries of the world. Developing nations as ours continue to face the isuues of rising unemployment levels. However, critical stakeholders are looking into possible meaning of combating this issue of unemployment. This paper examined how skill acquisition in the business education programme is aimed at combating unemployment. This study discussed the concept of unemployment, business education and skill acquisition. It also highlighted the types of employment, roles of business education in creating job opportunities, importance of skill acquisition and factors responsible for the rising unemployment rate in Nigeria. The problem of unemployment can be combated through skill acquisition especially via business education. Skill acquisition is the systematic and sequential development of skills that promotes efficiency and effectiveness in the performance of a specific job. It was concluded that in order to combat unemployment, there is need for students of business education to be acquainted with the various skills in the business education programme. Also, unemployed youths are encouraged to undergo training in other vocational areas for them to acquire the skills that will enable them to be self-employed and government should devise means of tackling all the factors responsible for the rising unemployment in the country. Amongst other suggestions is that adequate funding should be provided by school authorities to build and equip skill acquisition center in Rivers State; qualified lecturers with adequate knowledge with various skills should be employed into the department of Business Education to teach Business Education practical skills; Business Education curriculum should accommodate practical skills; Business Education lecturers should be trained and retrained to acquire more skills of teaching Business Education; Business Education students should be willing to cultivate keen interest in acquiring the skills and competencies in the Business Education programme and that students should be committed and dedicated to the practical contents of business education programme.

Keywords: *Skill Acquisition, Business Education and Unemployment.*

Introduction

Skill acquisition is vital for Nigeria to grow economically, particularly in this era of economic recession. The Federal Government of Nigeria recognized skills acquisition and development as an important factor in the drive to enhance productivity reduce youth unemployment and achieve sustainable economic development (Nwaukwa, Iloeje, Nzeh & Nwagu, 2018). Skills refer to abilities, capabilities, aptitude and expertise acquired through deliberate, systematic and sustained training necessary to adaptively perform job functions effectively. A skill is the learned ability to carry out a task with pre-determined results often within a given amount of time, energy or both (Uchendu, 2015).

Skill is the ability to do something well, usually gained through training or experience. Vanpatten and Benati (2017) saw skill as the ability to do rather than underlying competence or mental representation. To clarify this concept, Masumeh (2014) identified nine defining attributes of a skill from a psychological perspective as follows: skill is learned, skill involves motivation, purpose and goals, skills require content and context knowledge, skills are performed and transferred in the presence of specific stimuli, skill involves problem solving relevant to the context, skill involves relative judgments with individual differences in skill performance evident, standards of excellence are important, skill involves comparable replication, and considerable periods of time are required to reach high levels of skill.

Skills acquisition refers to ability to be trained on a particular task or function. It is a form of training of individuals or group of individuals to acquire skills needed for self-sustenance (Idoko, 2014). Skill acquisition is the manifestation of idea and knowledge through training geared towards instilling in the youths the spirit of entrepreneurship needed for meaningful development (Douli, 2012). Skill acquisition is a major tool for extreme poverty and hunger eradication with the aim of creating an avenue for jobs and wealth which will bring self-reliance and sufficiency and, contribute to the growth and development of a country’s economy (Isaac, 2019). Skill acquisition is the ability to be trained on a particular task or function (Mike, 2014).

Idoko (2014) posited that skill acquisition requires the gathering of various abilities that enhance task execution through the coordination of both theoretical and practical form of knowledge. It involves the training of people in different fields of trade under a legal agreement between the trainers and the trainees for certain duration and under certain conditions. Nwaukwa, Iloeje, Nzeh and Nwagu (2018) stated that skill acquisition leads to employment generation in small and medium enterprises such as computer business centers, book binding centers, laminating centers, computer sales, computer training, internet centers (cybercafe), business registration, photocopying centers, reprographic, and printing press among others. According to the Development Education Center (2019), skill acquisition and youth development are emphasized in Nigeria to meet the following needs: reduction in youth unemployment rate, diversification of job opportunities, effective function, crime reduction, employment generation and national development. Equipping students with relevant skills is an important mandate of business education programme at both secondary and tertiary education in Nigeria (FRN, 2013). This is noted in the policy statement of National Policy on Education (FRN, 2013) which expressly stated that the primary goal of business education is to produce skillful and dynamic business education graduates for gainful employment or self-employment. In line with this expressed policy objective, Ubulom and Enyoghasim (2012) defined business education as a programme of study that equips students with knowledge, attitudes, skills and competencies needed to become productive members of the society. Ubulom and Enyoghasim (2012) stated that business education programme equips its recipients with skills such as communication skills, computation skills, personal reliability skills, economic adaptability skills and group and organizational effectiveness skills with numerous opportunities available to business education graduates, the programme is believed to be a veritable tool for sustainable development, and tackling widespread graduate unemployment.

Additionally, business education programme develops students' managerial and business decision making skills and practical experiences in form of industrial training (IT). Osuala maintained that these skills are highly needed by business education graduates for gainful employment as employees or self-employed. Similarly, Ubulom and Enyaghasim (2012) maintained that business education students are equipped with entrepreneurial skills to establish small scale businesses like photocopying, computer and internet centers, computer and phone repair, phone accessory sales, computer training, printing press, rental services, and land and house agency among others and manage them successfully. With these opportunities, business education is believed to be a veritable tool for sustainable development and tackling widespread youth unemployment. Kao and Mao (2011) maintained that training in business education programme enables students to acquire a set of strategic, analytical, managerial and decision-making skills to effectively deal with problems in the real world. Business education also teach creativity skills, innovative skills, problem-solving skills, decision-making skills, information and communication technology skills and critical-thinking skills among others. Business education provides trainings to equip recipients with technical skills, managerial skills, communication skills and business decision-making capability (Ezeani, 2017). These courses incorporate practical experiences, in the form of presentations, industrial visits, and interaction with experts from the industry. No wonder developed countries such as China, Canada, and USA are investing heavily in business education programmes so as to improve the quality of students' skill acquisition for national development. Unemployment is one of the causes of social vices in many parts of the world especially in Nigeria. Business education is that aspect of vocational education which provides skills, knowledge, competencies and attitudes necessary for effective employment in a specific business occupation. So, business education been an aspect of vocational education emphasized a lot in teaching of skill acquisition.

According to Udo (2018) business education is a comprehensive activity-based occupational education programme that is concerned with the acquisition of practical skills, abilities, understanding, attitudes, work habits and competencies that are requisite to success in any chosen business occupation. Skill acquisition is the ability to be trained on a particular task or function till you become an expert on the skill. According to Udo and Babangide (2017) skill acquisition is the capacity to be trained on a particular business occupation and become a proficient professional in it. In the view of Mshelia (2019), Omidiji and Ogwu (2019) skill acquisition in business education include communication skill, reading skill, manipulative skill, shorthand skill, keyboarding skill, computer skill book keeping skill etc.

Skill Acquisition

Skill acquisition is the main focus of business education programme for self-reliance and more employable motives. Omidi and Ogwu (2019) defined skill acquisition as a systematic and sequential development of skills that promotes efficiency and effectiveness in the performance of a specified job. Skill acquisition is the process of developing capacities through all levels of education and training, occurring in formal, non-formal, and on-the-job settings, which enable individuals in all areas of the economy to be fully and productively engaged in livelihoods and to have the capacity to adapt their skills to meet the changing demands and opportunities of the economy and labour market especially in the e-world (Enang & Okute, 2019). Skill acquisition is the ability to be trained on a particular task or function and become expert in it. Some of the needed skills in business education for one to be self-reliant include communication skills, reading skills, and manipulative skills. Skill acquisition has been described by many as the recipe for eradicating extreme poverty and hunger by creating avenue for employment, thereby creating job opportunities and wealth creation. Gumbari in Mshelia (2019) asserts that skill acquisition in Nigeria should be perceived as a catalyst to increase the rate of economic growth, create job opportunities, reduce import of manufactured goods and decrease trade deficits that result from such import.

Ezeji and Okorie as cited in Nwanaka and Amaehule (2017) assert that while stressing the importance of skill acquisition in the national growth, emphatically contended, "that Nigeria's social and economic problems will drastically be reduced if people are given adequate vocational training in skills, raw materials, machineries and equipment". It is only with skilled men that materials can be harnessed, manipulated and transformed into products with quality skill acquisition programme.

Oluwadare (2019) saw skill acquisition as the ability to learn a skill, which can be intellectual such as learning to listen, speak, read and write or manual such as learning to build or make something. According to the Development Education Center (2019), skill acquisition and youth development is emphasized in Nigeria to meet the following needs: reduction in youth unemployment rate, diversification of job opportunities, effective function, crime reduction, employment generation and national development. Nwaukwa, Iloeje, Nzeh and Nwagu (2018) stated that skill acquisition leads to employment generation in small and medium enterprises such as computer business centers, book binding centers, laminating centers, computer sales, computer training, internet centers (cybercafe), business registration, photocopying centers, reprographic, and printing press among others. These skills are highly needed by business education graduates for gainful employment as employees or self-employed.

Aderogba (2011) maintains that effective skills acquisition in education is an indispensable tool towards producing a self-reliant nation and dynamic economy. It is therefore important every nation should strive to have a thorough assessment of the citizen on skills acquired in order to provide those skills that are yet to be achieved which can make the nation to compete other nations of the world. Educational programmes have to be tailored towards skill programmes in which Business Education has made considerable acquisition programmes (Idoko, 2014). Skill acquisition is the manifestation of idea and knowledge through training geared towards instilling in the youths the spirit of entrepreneurship needed for meaningful development (Douli, 2012). Skill acquisition is a major tool for extreme poverty and hunger eradication with the aim of creating an avenue for jobs and wealth which will bring self-reliance and sufficiency and contribute to the growth and development of a country's economy. Skill acquisition is the ability to be trained on a particular task or function (Mike, 2014). Idoko (2014) posited that skill acquisition requires the gathering of various abilities that enhance task execution through the coordination of both theoretical and practical form of knowledge. It involves the training of people in different fields of trade under a legal agreement between the trainers and the trainees for certain duration and under certain conditions.

Ubulom and Enyoghasim (2012) defined business education as a programme of study that equips students with knowledge, attitudes, skills and competencies needed to become productive members of the society. Ubulom and Enyoghasim (2012) stated that business education programme equips its recipients with skills such as communication skills, computation skills, personal reliability skills, economic adaptability skills and group and organizational effectiveness skills. With numerous opportunities available to business education graduates, the programme is believed to be a veritable tool for sustainable development, and tackling widespread graduate unemployment. Additionally, *business education programme* develops students' managerial and business decision making skills and practical experiences in form of industrial training (IT).

Similarly, Ubulom and Enyaghasim (2012) posited that business education students are equipped with entrepreneurial skills to establish small scale businesses like photocopying, computer and internet centers, computer and phone repair, and phone accessory sales, computer training, printing press, rental services, and land and house agency among others and manage them successfully. With these opportunities, business education is believed to be a veritable tool for sustainable development and tackling widespread youth unemployment. Busola (2016) stated other vocational skill acquisition one can practice generally to include;

1. **Farming skills:** In farming, there are many people who practice the skill of rearing day old chickens, broilers, cockerels, and eggs, sheep, goats, pigs, and cows, fish and shrimps. Some others have the skill in producing cereals, legumes, fruits and vegetables. All these are some of the skills processed by farmers.
2. **Photography:** Photography is the technique of capturing an event, a scene or a thing on a picture. This would be printed or viewed on card or a projected screen. A picture is an image. Photography is now an accepted method of keeping records of events such as parties, wedding, birthdays, seminars, etc. Originally, it involves lenses and the photographic films, but with the technology, the digital computer generates what can be stored and reproduced in the computer memory.
3. **Desktop publishing and networking:** This has to do with the use of computer for compiling, producing, and disseminating information and reading materials without going through the rigour of passing through a publisher. Computer processing has reduced drastically the vigorous work of publishing such as script editing, typing, artworks and designs. Networking entails linking of the computers through local area connection via cables or servers through the satellite to servers in other parts of the world. Local area networks link computers on the net together so that they share information or work simultaneously on the same or different aspects of a project.
4. **Bead making:** Bead making has become a very profitable venture in the society today. If you have taken your time to look around, especially on wedding and different ceremonies, you will discover that so many ladies make use of it. Bead is simple and easy to learn how to make. Your ability to innovate and be creative will help you stand out in this venture.
5. **Fashion designing:** Fashion designing is the art or application of design and aesthetics or natural beauty to clothing and accessories. Fashion design is influenced by cultural and social attitudes, and has varied over time and place. Fashion designers work in a number of ways in designing clothing and accessories such as bracelets and necklace.

Ajinwo (2022), posited that soft skills acquisition are relevant and essential in teaching and learning Business Education courses. He outlined the skills as follows; problem solving skill, team working skill, time management skill, communication skill, critical thinking skill and creativity and innovation skill. These skills listed above leads to the understanding of ethical values, application of leadership trait of individual employee to fast track employment of such graduates who has acquired these skills.

More than a decade ago, various inventions are continually uprising that could enhance teaching and other administrative works (Koko & Okogun, 2020). According to Bao (2020) some universities such as Harvard, MIT, Yale, Oxford, Cambridge, Tsingghua, Peking University, among others are moving into digital pedagogy. Most educational institutions in Nigeria are currently based only on traditional methods of teaching including schools, colleges and universities (Dhawan, 2020). However, some academic units have introduced the use of technology to facilitate academic activities. Instructional pedagogy of Office management and technology involves purposeful transfer of knowledge, skills, competencies and attitude formation in formal educational set-up. The new era of digital explosion has changed the traditional way of instructional delivery in the classroom to a more innovative, interesting and facilitating one, which is regarded as active, integrative and evaluative in nature.

Importance of Skill Acquisition

Busola (2016) indicated the following as the importance of skill acquisition:

1. **Crime rate reduction:** Skill acquisition reduces the crime rate in various countries. People with skills often think about how to make money and not how to steal. They are engaged with something rather than being idle. When someone has a skill to trade, he misses the chances of engaging in anti-social behaviours.
2. **Employment opportunities:** Many governments are still finding it difficult to provide jobs for their citizens because the citizens are lacking important skills they need. Anyone with a skill is able to employ and provide jobs opportunities for others.
3. **Improved quality of life:**
   (a) People become increasingly aware of practices that help to improve life expectancy.
   (b) People learn how to obtain help information quickly.
   (c) Easy and convenient communication through phone calls, emails and money transfer.
   (d) The feat performed by the computer and relative items helps man to appreciate the immense potential of the human capacity.
4. **Self-employment:** A skill acquired man is a self-employed man. A self- employed person can never go hungry because the skill he acquired provides food for him on daily basis. But one who lacks skill acquisition will find it difficult to be self-employed because he has nothing to offer. Skills acquired by website designers are what they use on their daily feeding instead of indulging in cyber-threat or online theft which is also related to internet.

Zakka, Bewaran, and Wetnwan (2017) suggest ways through which skills acquisition in Office Technology and Management (OTM) can revamp the Nigerian Economy:

1. Employment generation and poverty reduction
2. Resource mobilization
3. Wealth creation and Increased GDP
4. Technological Development
5. Improvement in standard of living
6. Reduction of urban drift and enhancement of social status of the citizenry
7. Source of government revenue
8. Industrial development.

Concept of Business Education

Business Education is a branch of vocational education. It is a part of education that involves the training of business skills to enable the students after the completion of their programme to set up their own businesses, thus, promoting self-employment and self-reliance. Business Education programme is offered at Colleges of Education and Universities in Nigeria with the aim of equipping the recipients with relevant skills, knowledge, attitude understanding of the business world. The knowledge acquired by Business Education graduates can contribute greatly to the growth of the Nigerian economy.

Koko (2019) opined that Business Education is described as an academic field that provides students with the methods, strategies, fundamentals and essentials required to do business effectively. It has become most sought out course of study in most higher institutions in Nigeria. History has it that in pre-colonial days, Africans were limited to rural lower level education in agriculture and religion for service to the white settlers. At independence however, the people seem to throw off such inclinations towards vocational education to receive training in areas that will provide opportunity to white-collar jobs.

Aliyu Udo (2016) describes Business Education as an aspect of vocational and technical education which is designed to develop competencies in management, administration, marketing, book keeping, accounting, office technology and information and communication technology. These are business skills that equip and empower graduates to live, learn and work as productive members in a globalized economy.

Onyesom and Ashibogu in Chundusu (2013) emphasize the goals and objectives of Business Education at all levels of education as the development of basic skills for personal use in the future as well as:

1. to acquire the basic knowledge and skills of Business Education;
2. to relate the knowledge and skills acquired for national development;
3. to develop basic skills in office occupation;
4. to provide the needed background for teaching in business subjects.

According to Iwu (2016) business education is the study that equips the individual with the occupational skills and knowledge that will enable him/her fit into, and finds job satisfaction in the labour market. Business education as a component of vocational education prepares individuals for career in business and also to be intelligent consumers of economic goods and services. It is a programme that prepares its students with skills and competencies needed for self-reliance and employment. Agbionu as cited in Nwogu (2015), defined business education as that form of instruction that both directly and indirectly prepares the businessman for his calling. This definition confirms with the vocational nature of business education. Afolabi (2018) saw business education as a type of training with the main goal of making people ready for entrance into a business career, and on having entered upon such a career making them capable of rendering efficient services therein, with the ability to advance their present levels of employment to high levels. Udo and Babangida (2017) business education is that aspect of vocational education which provides skills, knowledge, competencies and attitudes necessary for effective employment in any specific business occupations. Aliyu in Umezulike (2015) defined business education as education for the development of skills/competencies, attitudes and attributes which are necessary for the efficiency of the economic system.

Amesi (2017) reveals the impacts of quality Business Education programme on skills acquisition by Business Education students in the following ways:

1. Develop in students the ability and desire to keep records for personal use
2. Provide commercial knowledge for personnel use and for further education
3. Develop in students the habit of wise use of services offered by commercial institutions
4. Develop in students the understanding of some of the problems and characteristics of business enterprise
5. Prepare and encourage students to be prudent and effective in the management of resources
6. Develop in students the ability to take down dictation from the Boss using shorthand or stenotype machine
7. Develop in students the ability to engender growth process and changes that are never ending
8. Develop in students the ability to make appointment for executive and reminding him her of the appointments
9. Develop in students the ability to keep personal records of events in the offices

Okoli Utoware, and Kaizer (2017) reveal the quality curriculum strategies for promoting Business Education programme in Universities as follows:

1. Appropriate Business Education curriculum design
2. Appropriate implementation of Business Education curriculum content
3. Review of existing Business Education curriculum to accommodate maximum skills
4. Business Education curriculum should be result-oriented and more responsible to needs
5. Business Education curriculum should encourage practical activities and work-based learning enterprise
6. Ensure that key competencies are integrated into Business Education appropriate means of assessment
7. Business Education curriculum should give learners access to appropriate up-to- technical equipment, teaching materials and infrastructure
8. Business Education curriculum should adherent to accreditation requirement

Okoli, Utoware and Kaizer (2017) also reveal the quality personnel strategies for acquisition of Business Education programme in universities as follows:

1. Recruitment of qualified teaching personnel in Business Education.
2. Teaching personnel in Business Education must have requisite skills to teach required courses
3. Teaching personnel in Business Education should have a competency-based education
4. Teaching personnel in business education must have good knowledge of Education courses
5. Training and retraining of teaching personnel in Business Education
6. Teaching personnel in Business Education must have appropriate knowledge of students' guidance and mentoring
7. Teaching personnel in Business Education must adhere to staff quality control
8. Teaching personnel in Business Education must be effectively motivated. The success skills acquisition in Business Education programme depends on the availability of qualified teachers that will stimulate the educational process and impart relevant skills to the students. Therefore, no educational system can underrate the quality of their teachers. The teachers can make or mar every educational system as the case may be.

Concepts of Unemployment

The state of being without any work yet looking for work is called unemployment. Unemployment in Nigeria is one of the most critical problems the country is facing.

Unfortunately, the government has not found any immediate solution to the scenario. According to Bosah in Oduma (2012) unemployment is a state of joblessness and idleness of one with labour requirements, potentials, skills, attitudes and competencies. Unemployment can also be seen as a phenomenon that arises when members of a country's labour force are unable to obtain their goals of participation in gainful occupation due to a situation in which supply of labour significantly exceeds demand for it (Okafor, 2015).

Unemployment is one of the causes of social vices in many parts of the world especially in Nigeria. Business education is that aspect of vocational education which provides skills, knowledge, competencies and attitudes necessary for effective employment in a specific business occupation. So, business education been an aspect of vocational education emphasized a lot in teaching of skill acquisition. According to Udo (2015) business education is a comprehensive activity-based occupational education programme that is concerned with the acquisition of practical skills, abilities, understanding, attitudes, work habits and competencies that are requisite to success in any chosen business occupation. Skill acquisition is the ability to be trained on a particular task or function till you become an expert on the skill. According to Udo and Babangida (2017) skill acquisition is the capacity to be trained on a particular business occupation and become a proficient professional in it. In the view of Mshelia (2019), Omidiji and Ogwu (2019) skill acquisition in business education include communication skill, reading skill, manipulative skill, shorthand skill, keyboarding skill, computer skill book keeping skill etc.

Anyaele (2018) defined unemployment as a situation where some people who fall within the ages of the working population, capable and willing to work, are unable to obtain befitting work to do. The state of being without any work yet looking for work is called unemployment. Unemployment is defined by the Bureau of Labour Statistics as people who do not have a job, have actively looked for work in the past for weeks and are currently available for work. Also, people who were temporarily laid off and were waiting to be called back to that job are included in the unemployment statistics The International Labour Organisation (2018) saw unemployment as when people are without jobs and they have actively looked for work within the past four months. Unemployed individuals are unable to earn money to meet financial obligations. Unemployment is the term referring to individuals who are unemployable and seeking a job but are unable to find a job. Unemployment occurs when one does not have a job. According to Udu and Agu as cited in Asaju, Arome and Anyio (2014) unemployment is a situation in which persons capable and willing to work are unable to find suitable paid employment.

Unemployment rate is the proportion or percentage of the labour force or working population which is not employed at any given point in time. Unemployment rate is usually represented using the symbol "U", and it is usually calculated as follows:

$$U = \frac{\text{Number of people unemployed x 100}}{\text{Labour force 1}}$$

Types of Unemployment

1. Cyclical unemployment occurs when there is not enough aggregate demand in the economy to provide jobs for everyone who wants to work. Demand for most goods and services falls, less production is needed and consequently fewer workers are needed, wages are sticky and do not fall to meet the equilibrium level, and unemployment results. Its name is derived from the frequent ups and downs in the business cycle (Wikipedia 2020).

2. Frictional unemployment arises when people leave their present job with the hope of getting a new and better one but fail to do so. It may or may not be a temporary unemployment depending on the prevailing economic situation. So, this is the period between the time the worker left his former work and the time of getting a new work (Anyaele 2018).

3. Structural unemployment arises as a result of slight changes in the industrial structure of a country. Workers will be retrenched as a result of economic recession and it happened in Nigeria in 1984, when many firms folded up as a result of this. It may also occur as a result of changes in production techniques (Anyaele, 2003).

4. Seasonal unemployment is caused by seasonal changes that affect some type of work. Construction workers are laid off during rainy season. Also, farmers stay idle in-between harvesting and planting period (Kimberly, 2020).

5. Classical or real-wage unemployment, occurs when real wages for a job are set above the market-clearing level causing the number of job-seekers to exceed the number of vacancies.

Busola (2016) stated other vocational skill acquisition one can practice generally to include:

1. **Farming skills** – In farming, there are many people who practice the skill of rearing day old chickens, broilers, cockerels, and eggs, sheep, goats, pigs, and cows, fish and shrimps. Some others have the skill in producing cereals, legumes, fruits and vegetables. All these are some of the skills processed by farmers.
2. **Photography** – Photography is the technique of capturing an event, a scene or a thing on a picture. This would be printed or viewed on card or a projected screen. A picture is an image.

Photography is now an accepted method of keeping records of events such as parties, wedding, birthdays, seminars, etc. Originally, it involves lenses and the photographic films, but with the technology, the digital computer generates what can be stored and reproduced in the computer memory.

3. **Desktop publishing and networking** - This has to do with the use of computer for compiling, producing, and disseminating information and reading materials without going through the rigour of passing through a publisher. Computer processing has reduced drastically the vigorous work of publishing such as script editing, typing, artworks and designs. Networking entails linking of the computers through local area connection via cables or servers through the satellite to servers in other parts of the world. Local area networks link computers on the net together so that they share information or work simultaneously on the same or different aspects of a project.

4. **Bead making** – Bead making has become a very profitable venture in the society today. If you have taken your time to look around, especially on wedding and different ceremonies, you will discover that so many ladies make use of it. Bead is simple and easy to learn how to make. Your ability to innovate and be creative will help you stand out in this venture.
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Factors Responsible for the Rising Unemployment in Nigeria

Umana (2018) stated the following as the factors responsible for the rising unemployment in Nigeria:

1. Corruption

Corruption is a dishonest or illegal behaviour, especially by the people in authority. It is an abuse of public office for private gain, which usually involves embezzlement of public funds, nepotism and falsification of data etc. Corruption has no doubt done an incalculable damage to every facets of the country. It has undermined democratic institutions, retarded economic growth and development; and cause poverty in the mist of plenty, it has prevented the country from making political, social and economic progress and ultimately brought about high level of mass unemployment in the country. It has denied millions of Nigerians access to education, housing, health, food and infrastructure (Umana, 2018).

2. Poor Management Practice

Nigerians are known for lack of good management culture. According to Umana (2018) the country is blessed with abundant natural resources. It is believed that if the resources are well harnessed, fully developed and well managed, Nigeria is capable of surmounting the problem of high unemployment and its attendant effects. Harnessing the nation's economy involves assessment of one's resources at present and allocating them to different competing sectors so as to meet certain goals. Nigeria does not lack good economic plans, what is lacking is proper implementation. The process of implementation has been taken over by corrupt and incompetent persons and failed results.

3. Neglect of Agricultural sector

Umana (2018) asserts that until early 1970s, agriculture was the mainstay of Nigeria economy. It constituted the major income earning for the country and the largest employer of labour as over 90 percent of the populace worked and earn their daily income from this sector. Following the rise in the price of petroleum (oil boom) in 1970s, and the attendance huge foreign income, the agricultural sector suffered a substantial decline till today.

Many analysts argue that there is a strong relationship between the neglect of agricultural sector and high rate of unemployment in the country. Agriculture remains a panacea for reducing the high rate of unemployment and poverty in Nigeria.

4. Infrastructural Decay

This is yet another dismal factor that has rendered millions of Nigerians unemployed. If the infrastructure is improved and empowered policies are put in place, people will have opportunity to employment and use their talent in sectors like textile which is capable of absorbing both skilled and semi-skilled workers.

No doubt that the inability of successive administration to tackle the problem in power sector has done an incalculable harm to all facets of the economy especially the manufacturing enterprises in the country.

5. Lack of Purposeful Leadership and Good Governance

There is a general agreement among political observers of Nigerian politics especially in recent times that the nation has never been lacking in terms of initiating good ideas towards enhancing the welfare of the citizens, what was lacking is the political will to turn these ideas into concrete results. Indeed, hardly had any administration come on board without a virgin plan professionally packaged to ease the agonizing pains of the masses, although these plans which come with great expectations are found to be more active on papers.

Successive administrations' effort to combat the menace of unemployment and its attendant effects over the years ended up in a deadlock and the reason is not far from corruption, lack of political- will to implement government projects, lack of good governance etc which also aggravates political instability.

6. Inflation

Inflation is the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country.

The edition of the Nigeria Development Update proposes near-term policy option organized around three priority objectives:

(a) Reduce inflation by implementing policies that support macroeconomic stability, inclusive growth, and job creation;
(b) Protect poor households from the impacts of inflation;
(c) Facilitate access to financing for small and medium enterprises in key sectors to mitigate the effects of inflation and accelerate the recovery.

7. Nepotism

Nepotism is the unfair use of power in order to get jobs or other benefits for your family or friends. The word "Nepotism" comes from the Italian word "nepote" which means the son, which has been used by the papal practice of granting special favors grandchildren or their relatives. So, favoring relatives on the basis of family ties, saying rather that nepotism means the employment of relatives or close friends, regardless of their merits and abilities (Dictionary, 2013).

Corruption is a phenomenon that is found both in the developed and developing countries, but at different levels and this can be observed a higher inclination of the poorest countries on corruption acts that he presents in developed countries. Gjinovci (2014), from a legal perspective, there are two types of corrupt behavior: active and passive Corruption. We are aware that corruption, a huge stretch or small, is a threat to all participants in a democratic society, especially to countries that are in a transition period. Fight corruption and put under control at times he appeared. The reason is easy to fight corruption at the time of its presentation, it is that it is very easy to identify and prevent. In more general terms, corruption is generally degrading effect on the system and social regulation. The boundaries of corruption are as inaccessible as is unattainable and human greed. Greed grows cure human justice system fails. Acts of corruption, related to violation of legal provisions and the professional code of ethics by the employees as public or private sector.

Role of Business Education in Creating Job Opportunities

Owojori in Omidiji and Ogwu (2019) opined that the three options in business education programme had the following vocational opportunities which can be acquired through practical oriented programme implementation:

1. Graduates of Marketing and Distribution education are expected to be very versatile as they can be engaged in.
   (a) Buying and selling of any product whether agricultural, technical, business, arts, etc.
   (b) Sales promotion of all products for organizations;
   (c) Promotion and advertisement of service occupations or organizations e.g. radio, television, cinema house etc.
2. Graduates of accounting education can write and publish books in accounting and organize workshops and seminars for organization.
3. Graduates of Office Technology and Management are secretaries who can engage themselves in the establishment of;
   (a) Business centers (have computers for production of documents, e-mail; browsing; typewriters for typing; fax machines for sending out documents; telephone services; photocopying; binding) and cybercafé centers.
   (b) Secretarial institutes where typists, stenographers and secretaries are been trained.
   (c) Writing and publish books in the field
   (d) Organize workshops and seminars for secretarial workers and
   (e) Consultancy services for organization in recruiting activities.

Conclusion

Business Education is education for and about business which prepares students in Colleges of Education and Universities to acquire relevant skills and knowledge for employment, carrier aspiration and general knowledge to contribute to the nation's economy. It is important therefore that quality assurance should be strictly adhered to in Business Education programme through quality curriculum delivery, quality teachers and quality funding being be provided in Nigeria universities.

Suggestions

Based on the Variables of this study, the researchers formed the following opinion:

1. Adequate funding should be provided by school authorities to build and equip skill acquisition center in Rivers State.
2. Qualified lecturers with adequate knowledge with various skills should be employed into the department of Business education to teach business education practical skills.
3. Business Education curriculum should accommodate practical skills.
4. Business Education lecturers should be trained and retrained to acquire more skills of teaching Business Education.
5. Business education students should be willing to cultivate keen interest in acquiring the skills and competencies in the business education programme.
6. Students should be committed and dedicated to the practical contents of business education programme.

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Enhancing Entrepreneurial Mind-Set and Innovation Capabilities through Mentorship Programs among Business Education Students in Universities in Rivers State

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Abstract

This study investigated how entrepreneurial mind-set and innovation capabilities can be enhanced through mentorship programs among business education students in universities in Rivers State. Three objectives, three research questions, and three hypotheses were formulated and guided the study. The study adopted a survey research design with a population of 815 final-year students of universities in Rivers State. The sample size of 265 respondents comprising of 124 males and 141 females was derived using Krejcie and Morgan table and simple random sampling technique was used to arrive at the final distribution of the sample size used for the study. A structured questionnaire titled; "Entrepreneurial Mind-set and Innovation Capabilities through Mentorship Programs Questionnaire" was used as the instrument for data collection. The instrument was validated by three experts, two from business education department and one from measurement and evaluation department. The instrument was subjected to a pilot study to ascertain its reliability, which yielded a reliability index of 0.80 through the Cronbach Alpha test. Mean and standard deviation were used to answer the research questions while the independent t-test was used to test the hypotheses at 0.05 level of significance. The findings of the study showed among others, that there is a significant difference in the level of mentorship programs among male and female business education students in universities in Rivers State and there is no significant difference in how mentorship programs enhance the entrepreneurial mind-set of male and female business education students in universities in Rivers State. The study concluded that mentorship programs have the potential to equally benefit both male and female business education students in developing their entrepreneurial mind-set and innovation capabilities. The study recommended, among others, that universities in Rivers State should prioritize the improvement of mentorship programs for business education students, particularly focusing on bridging the gap between male and female students and Universities in Rivers State should continue to prioritize a wide range of mentorship programs to enhance the entrepreneurial mind-set of business education students regardless of gender.

***Keywords**: Entrepreneurial Mindset, Innovation, Capabilities, Mentorship, Business Education.*

Introduction

Traditionally, it has been assumed that when considering a venture, one must begin with a great idea, a great product, a viable market, a vast reservoir of resources, etc. Without any doubt, a great idea is essential in any worthwhile activity; what is even more important is to translate that idea into reality continuously and ensure operational competitiveness. An entrepreneurial mindset plays an important role in successfully translating a business idea into reality and acquiring a new dimension of mindset, namely combining a great idea with leadership, to achieve success. In a market where innovation is critical to success, any organization will benefit from an employee who can think creatively and take risks. This entrepreneurial mindset not only promotes innovation but also fosters a culture of adaptability and resilience, ensuring long-term success in a rapidly changing business landscape.

This is the mindset required and should dominate the thinking of entrepreneurs, including business education graduates from our universities.

Business education has been defined in several ways, most of which highlight its vocational nature. According to Azih and Wagbara (2018), business education is a component of technical and vocational education that is widely recognized around the world as a means of providing students with long-term competency skills in industries, jobs, and businesses for livelihood and socioeconomic development. According to Adizu et al. (2020), business education is a type of vocational and technical education in Nigeria that focuses on providing individuals with the skills and knowledge they need to succeed in a variety of industries. With the need to develop an entrepreneurial mindset and innovation capabilities among business education graduates, there is a growing emphasis on practical training, internships, and hands-on experience in addition to theoretical knowledge. This holistic approach ensures that graduates are well-equipped to adapt to the ever-changing demands of the global economy and contribute effectively to their chosen fields.

Consequently, Edokpolor and Egbri (2017) opine that the goals of Business Education incorporate: preparing students for specific careers in office occupations; equipping students with the requisite skills for job creation and entrepreneurship; and exposing students to knowledge about business, including a good blend of academic and practical components. Ultimately, the integration of theory and practice in Business Education programs helps students develop a well-rounded skill set that is essential for success in today's competitive job market. Graduates are not only knowledgeable about business concepts but also have the hands-on experience needed to excel in their chosen careers. As such, entrepreneurial mindset and innovation capabilities are key components of a successful Business Education program. By fostering creativity and critical thinking, students are better equipped to adapt to the ever-changing demands of the business world. This comprehensive approach prepares graduates to not only succeed in their careers but also to drive innovation and growth in their industries.

Entrepreneurial mindset refers to the characteristics that distinguish entrepreneurs from non-entrepreneurs, including intentions, thought processes, and skills. It is the result of metacognitive awareness. It is also the ability to recognize changing environments and demands, adjust one's thought process, and equip oneself with the necessary skills (Sofoluwe et al., 2013). Davis et al. (2016) expanded their definition of an entrepreneurial mindset to include the ability to quickly identify, act, and bring together available resources, thereby capitalizing on available opportunities while making decisions under uncertain conditions. According to McMullen and Kier (2016), an entrepreneurial mindset is the ability to identify and maximize opportunities despite the constraints of current available resources. Consequently, developing an entrepreneurial mindset involves being adaptable, resourceful, and resilient in the face of challenges. This mindset allows individuals to navigate uncertainties and take calculated risks in pursuit of their goals.

According to Kaya (2015), innovation is derived from the Latin word innavatus, which means "to make something new," and it is the result of resource efficiency and productivity. Innovation is currently a widely studied topic, mainly in manufacturing, information technology and finance, but little discussed or explored in the context of personal development and entrepreneurship. This highlights the importance of incorporating innovative thinking into entrepreneurial endeavors to stay ahead in today's competitive landscape. According to Meira et al. (2019), innovation capacities are crucial for entrepreneurs to adapt to changing market demands and create unique value propositions that set them apart from competitors. By fostering a culture of innovation within their businesses, entrepreneurs can drive growth and sustain long-term success in an ever-evolving marketplace. Thus, when business education students and graduates focus on developing their innovation skills, they are better equipped to navigate challenges and seize opportunities in the dynamic business environment.

Starting a business can be a lonely affair, starting entrepreneurs need a listening ear, and many (university) start-up programs include mentoring in their support programmes (Klofsten & Öberg, 2012).

However, the approach to teaching business education of which entrepreneurship is a key component, has achieved little in helping students develop entrepreneurial mindsets and innovation capabilities among students and graduates. However, this study envisages that incorporating a mentorship programme can significantly enhance the development of these skills by providing real-world guidance and support from experienced entrepreneurs. According to St-Jean and Audet (2012), mentoring is a support relationship between an experienced entrepreneur (the mentor) and a new entrepreneur (the mentee) to help the latter's personal development. By connecting students with mentors who have successfully navigated the challenges of entrepreneurship, business education programs can better prepare future leaders to drive innovation and growth in the marketplace. On this basis, this study investigated how entrepreneurial mindset and innovation capabilities can be enhanced through mentorship programs among business education students in universities in Rivers State.

Statement of the Problem

The increasing level of poverty among business education graduates from universities in Rivers State due to high unemployment rates has been a source of concern for policymakers and stakeholders in the region. This is a result of the high expectations placed on these graduates to secure well-paying jobs upon graduation, which are often not readily available in the local economy or even become great entrepreneurs and job creators themselves (Amadi, 2018). It is believed that a business education programme is an alternative solution to address this issue as it equips graduates with the necessary skills and knowledge to start their businesses and contribute to economic growth in the region. Unfortunately, due to limited resources and funding, not all universities in the region can offer comprehensive business education programs. This creates a gap in the market for skilled graduates who are ready to take on entrepreneurial roles and contribute positively to the economy.

Consequent to the foregoing, the process of training and educating business education graduates is becoming questionable as graduates often display a low level of entrepreneurial mindset and innovative capacities resulting in a lack of competitiveness in the market. For instance, the entrepreneurial mindset of many business education graduates can be described as lacking in creativity and risk-taking, which are essential qualities for success in the business world. As a result, upon graduation, many such graduates struggle to start their businesses or make significant contributions to existing companies. Furthermore, the innovative capacities of business education graduates are often found to be insufficient, leading to a lack of new ideas and solutions in the workplace. This is often part of the reason why employers describe these graduates as lacking the ability to think outside the box and adapt to rapidly changing environments.

To thrive in today's competitive market, business education programs must focus on fostering entrepreneurial mindset and innovative capacities among their students. However, a mentorship program is envisaged as a potential solution to bridge this gap and provide students with the necessary skills and guidance to succeed in the ever-evolving business world. By pairing students with experienced professionals who can offer insights and support, mentorship programs can help develop the creative thinking and problem-solving abilities that are essential for success in today's workplace.

Aim and Objectives of the Study

The study investigated how entrepreneurial mind-set and innovation capabilities can be enhanced through mentorship programs among business education students in universities in Rivers State. The specific objectives of the study were to:

1. Determine the level of mentorship programs among male and female business education students in universities in Rivers State.
2. Ascertain how mentorship programs can enhance the entrepreneurial mind-set of male and female business education students in universities in Rivers State.
3. Examine how mentorship programs can enhance the innovation capabilities of male and female business education students in universities in Rivers State.

Research Questions

The following research questions guided the study:

1. What is the level of mentorship programs among male and female business education students in universities in Rivers State?
2. How can mentorship programs enhance the entrepreneurial mind-set of male and female business education students in universities in Rivers State?
3. How can mentorship programs enhance the innovation capabilities of male and female business education students in universities in Rivers State?

Hypotheses

1. There is no significant difference in the level of mentorship programs among male and female business education students in universities in Rivers State.
2. There is no significant difference in how mentorship programs enhance the entrepreneurial mind-set of male and female business education students in universities in Rivers State.
3. There is no significant difference in how mentorship programs enhance the innovation capabilities of male and female business education students in universities in Rivers State.

Methods

The study adopted a survey research design. The design was adopted since the study is concerned with the description of events as they are. Nwankwo (2013) asserted descriptive survey research involves the researcher gathering data from a sample of items considered to be representative of the entire group which describes certain features of the sample. The population of this study consisted of 815 final-year students of universities in Rivers State. The population was drawn from the Department of Business Education from the three universities in Rivers State that offers business education. They include the University of Port Harcourt (43), Rivers State University (154), and Ignatius Ajuru University of Education (618). The sample of 265 respondents, comprised of 124 males and 141 females was used for the study. The sample was derived from the population of the study based on the recommendation of the Krejcie and Morgan, (1970) sample size determination table. The table recommended that for a population of 801-850, a sample size of 265 should be utilized. However, in selecting the respondents, a simple random sampling technique was used to ensure that every member of the population stands the chance to be included in the study. However, based on Bowley's proportional allocation formula adopted, the sample selected from the institutions comprised 14 for UNIPORT, 50 for RSU, and 201 for IAUE. A structured questionnaire designed by the researcher titled, "Entrepreneurial Mindset and Innovation Capabilities through Mentorship Programs Questionnaire (EMICMPQ)," was used to gather data from the respondents based on the items of the questionnaire. The instrument was a 30-item questionnaire scaled on a 4-point Likert scale of Strongly Agree (SA) = 4 points; Agree (A) = 3 points; Disagree (D) = 2 points; and Strongly Disagree (SD) = 1 point with a 2.5 criterion mean. To ensure that the instrument measured what it ought to measure, face, and content validity were carried out by two experts from the business education department and one from measurement and evaluation department. The comments and suggestions from the experts were taken into account while revising the instrument. The instrument was tested for reliability through a pilot study with a reliability coefficient index of r = 0.801 ascertained through the Cronbach Alpha test. The copies of the questionnaire were administered to and retrieved from the respondents at the various institutions used for the study. However, to ensure high returns of the administered questionnaire, research assistants were recruited to aid in the distribution and retrieval of copies of the questionnaire. All 265 copies of the questionnaire were properly filled and thus used for further analysis, which showed a response rate of 100%, indicating that the respondents were generally cooperative and willing to participate in the study. The collected data was analysed using the Statistical Package for Social Sciences (SPSS, Ver. 22) using descriptive and inferential statistics. The mean score and standard deviation were used to answer the research questions, while the independent t-test was used to test the hypotheses at the 0.05 level of significance.

Results

Research Question 1: What is the level of mentorship programs among business education students in universities in Rivers State?

Table 1: Mean and standard deviation of the level of mentorship programs among business education students in universities in Rivers State **N = 265**

S/N	Items	Male (n=124)		Female (n=141)	
		$\bar{x}$	SD	$\bar{x}$	SD
.1	One-on-one mentoring is practiced at my university, where a faculty member meets regularly with a student to provide personalized support and guidance.	1.56	0.78	1.83	1.04
.2	Peer mentoring is practiced at my university, where students in the same programme or year group support each other	2.81	0.91	3.01	0.82
.3	Faculty mentoring is practiced at my university, where professors provide guidance and advice to students	1.69	0.91	1.66	0.84
.4	Group mentoring with alumni from the business school is practiced at my university, where students can gain insights from various experienced professionals	1.76	1.02	1.91	1.02
.5	Alumni mentoring is practiced at my university, where former students offer career advice and networking opportunities	1.85	1.03	1.85	1.02
.6	Industry mentoring is practiced at my university, where professionals from the business world mentor students	2.86	0.86	2.70	1.06
.7	Cross-disciplinary mentoring is practiced at my university, where students are paired with mentors from different fields to gain diverse perspectives	1.73	0.92	2.14	1.09
.8	Virtual mentoring is practiced at my university, where mentorship is conducted online through video calls and messaging platforms	1.91	1.03	2.22	1.10
.9	Executive mentorship for senior-level students preparing for the workforce is practiced at my university, where students are paired with industry leaders who provide career advice	1.93	1.04	2.23	1.14
.10	Leadership development mentorship for aspiring entrepreneurs is practiced at my university, where students can learn from successful business owners and receive guidance on starting their ventures.	1.85	0.99	2.23	1.12
	Grand Mean	**2.00**		**2.18**	

Criterion Mean = 2.5: Mean: 1.0-1.74 = SD, 1.75-2.49=D, 2.50-3.24 = A, 3.25-4.00=SA.

Table 1 shows the level of mentorship programs among business education students in universities in Rivers State. The result showed that the majority of the male respondents agreed with items 2 and 6, with their mean scores within the range of 2.50–3.24. However, the majority of the male respondents disagreed with items 4, 5, 8, 9, and 10, with their mean scores within the range of 1.75–2.49. Also, the majority of the male respondents strongly disagreed with items 1, and 3, with their mean scores within the range of 1.00–1.74. On the other hand, the result showed that the majority of the female respondents agreed with items 2 and 6, with their mean scores within the range of 2.50–3.24. However, the majority of the female respondents disagreed with items 1, 4, 5, 7, 8, 9, and 10, with their mean scores within the range of 1.75–2.49. Also, the majority of the female respondents strongly disagreed with item 3, with their mean scores within the range of 1.00–1.74. Thus, the grand mean of 2.00 and 2.18 for male and female respondents imply that both genders disagree on the level of mentorship programs among business education students in universities in Rivers State. Thus, the level of mentorship programs among business education students in universities in Rivers State is very poor.

Research Question 2: How can mentorship programs enhance the entrepreneurial mindset of business education students in universities in Rivers State?

Table 2: Mean and standard deviation of how mentorship programs enhance the entrepreneurial mindset of business education students in universities in Rivers State **N = 265**

S/N	Items	Male (n=124)		Female (n=141)	
		$\bar{x}$	SD	$\bar{x}$	SD
.11	One-on-one mentoring can provide personalized guidance and support tailored to the student's specific needs and goals.	3.15	0.71	3.11	0.71
.12	Peer mentoring can foster collaboration and idea-sharing among students, creating a supportive community of aspiring entrepreneurs.	2.85	0.93	2.94	0.85
.13	Faculty mentoring can offer valuable industry insights and connections to help students navigate the business landscape.	2.97	0.91	3.13	0.81
.14	Group mentoring with alumni from the business school can provide real-world advice and mentorship from successful professionals who have gone through similar experiences.	3.44	0.70	3.57	0.60
.15	Alumni mentoring can offer a unique perspective on career development and opportunities in the business world, drawing from their own experiences and networks.	3.27	0.77	3.36	0.76
.16	Industry mentoring can provide students with current trends and best practices in the business world, helping them stay ahead of the curve.	3.35	0.76	3.55	0.60
.17	Cross-disciplinary mentoring can offer students a diverse range of perspectives and approaches to problem-solving, enhancing their critical thinking skills and adaptability in the ever-changing business environment.	3.28	0.75	3.45	0.71
.18	Virtual mentoring can give students flexibility and access to mentors worldwide, expanding their global network and cultural awareness.	3.06	0.90	3.09	0.95
.19	Executive mentorship for senior-level students preparing for the workforce can offer valuable insights and guidance from experienced professionals, helping them confidently navigate the complexities of the business world.	3.12	0.76	2.82	0.96
.20	Leadership development mentorship for aspiring entrepreneurs can offer personalized guidance on honing their leadership skills, strategic decision-making, and fostering innovation within their ventures.	2.92	0.77	2.64	1.01
	Grand Mean	**3.41**		**3.17**	

Criterion Mean = 2.5: Mean: 1.0-1.74 = SD, 1.75-2.49=D, 2.50-3.24 = A, 3.25-4.00=SA.

Table 2 shows how mentorship programs can enhance the entrepreneurial mindset of business education students in universities in Rivers State. The result showed that the majority of the male respondents strongly agreed with items 14, 15, 16 and 17, with their mean scores within the range of 3.25–4.00. Also, the majority of the male respondents agreed to items 11, 12, 13, 18, 19, and 20, with their mean scores within the range of 2.50–3.24. On the other hand, the result showed that the majority of the female respondents agreed to items 14, 15, 16 and 17, with their mean scores within the range of 3.25–4.00. Also, the majority of the male respondents agreed to items 11, 12, 13, 18, 19, and 20, with their mean scores within the range of 2.50–3.24. Thus, the grand mean of 3.41 for male students shows that the students strongly agree that mentorship programs can enhance the entrepreneurial mindset of business education students in universities in Rivers State, while the grand mean of 3.17 for females shows that the students agree that mentorship programs can enhance the entrepreneurial mindset of business education students in universities in Rivers State.

Research Question 3: How can mentorship programs enhance the innovation capabilities of business education students in universities in Rivers State?

Table 3: Mean and standard deviation of how mentorship programs enhance the innovation capabilities of business education students in universities in Rivers State N = 265

S/N	Items	Male (n=124)		Female (n=141)	
		$\bar{x}$	SD	$\bar{x}$	SD
.21	One-on-one mentoring can provide personalized guidance and support to individuals, helping them develop their skills and knowledge in a specific area.	3.10	0.73	2.91	0.88
.22	Peer mentoring can also foster collaboration and knowledge sharing among individuals, leading to a more diverse range of perspectives and ideas being brought to the table.	2.91	0.77	2.85	0.83
.23	Faculty mentoring can also help students navigate the academic and professional landscape, providing valuable insights and connections that can further enhance their innovation capabilities.	2.90	0.77	2.96	0.80
.24	Group mentoring with alumni from the business school can provide students with real-world insights and networking opportunities that can help them succeed in their careers.	3.34	0.67	3.34	0.75
.25	Alumni mentoring can provide students with valuable guidance and advice based on their own experiences in the field.	3.25	0.62	3.22	0.71
.26	Industry mentoring can offer students the opportunity to learn from professionals currently working in their desired field, gaining practical knowledge and industry-specific skills.	3.25	0.74	3.31	0.72
.27	Cross-disciplinary mentoring can expose students to different perspectives and approaches, fostering creativity and collaboration across various disciplines.	3.37	0.63	3.38	0.68
.28	Virtual mentoring can provide students with flexibility in scheduling and the ability to connect with mentors from around the world, expanding their network and access to diverse perspectives.	3.17	0.70	3.15	0.85
.29	Executive mentorship for senior-level students preparing for the workforce can offer insights into navigating corporate culture, leadership development, and strategic decision-making.	2.67	1.04	3.13	0.97
.30	Leadership development mentorship for aspiring entrepreneurs can guide building a strong team, developing a business strategy, and overcoming challenges in a competitive market.	2.52	0.93	2.75	0.90
	Grand Mean	**3.05**		**3.10**	

Criterion Mean = 2.5: Mean: 1.0-1.74 = SD, 1.75-2.49=D, 2.50-3.24 = A, 3.25-4.00=SA.

Table 3 shows how mentorship programs can enhance the innovation capabilities of business education students in universities in Rivers State. The result showed that the majority of the male respondents strongly agreed to items 24, 25, 26 and 27 with their mean scores within the range of 3.25–4.00. Also, the majority of the male respondents agreed to items 21, 22, 23, 28, 29, and 30, with their mean scores within the range of 2.50–3.24. On the other hand, the result showed that the majority of the female respondents strongly agreed with items 24, 26, and 27 with their mean scores within the range of 3.25–4.00. Also, the majority of the male respondents agreed to items 21, 22, 23, 25, 28, 29, and 30, with their mean scores within the range of 2.50–3.24. Thus, the grand mean of 3.05 and 3.10 for males and females respectively show that both students agree that mentorship programs can enhance the innovation capabilities of business education students in universities in Rivers State.

Hypothesis 1: There is no significant difference in the level of mentorship programs among male and female business education students in universities in Rivers State.

Table 4: Summary of independent t-test on the difference in the level of mentorship programs among male and female business education students in universities in Rivers State

Respondents	n	$\bar{x}$	SD	df	t_{cal}	t_{tab}	Sig.	Decision
Male	124	19.95	3.39	263	3.78	1.96	0.00	Reject:HO_1
Female	141	21.78	4.34					

Table 4 shows that t_{cal} = 3.78, df = 263, and t_{tab} = 1.96. Therefore, since $t_{cal}>t_{tab}$ and $P<0.05$, then there is a significant difference in the level of mentorship programs among male and female business education students in universities in Rivers State. Hence, the null hypothesis one is rejected at a 0.05 level of significance

Hypothesis 2: There is no significant difference in how mentorship programs enhance the entrepreneurial mindset of male and female business education students in universities in Rivers State.

Table 5: Summary of independent t-test on how mentorship programs enhance the entrepreneurial mindset of male and female business education students in universities in Rivers State

Respondents	n	$\bar{x}$	SD	df	t_{cal}	t_{tab}	Sig.	Decision
Male	124	31.42	4.89	263	0.46	1.96	0.65	Retain: HO_2
Female	141	31.67	3.96					

Table 5 shows that t_{cal} = 0.46, df = 263, and t_{tab} = 1.96. Therefore, since $t_{cal}<t_{tab}$ and $P>0.05$, then there is no significant difference in how mentorship programs enhance the entrepreneurial mindset of male and female business education students in universities in Rivers State. Hence, the null hypothesis two is retained at 0.05 level of significance.

Hypothesis 3: There is no significant difference in how mentorship programs enhance the innovation capabilities of male and female business education students in universities in Rivers State.

Table 6: Summary of independent t-test on how mentorship programs enhance the innovation capabilities of male and female business education students in universities in Rivers State

Respondents	n	$\bar{x}$	SD	df	t_{cal}	t_{tab}	Sig.	Decision
Male	124	30.48	3.81	263	1.05	1.96	0.30	Retain: HO_3
Female	141	31.01	4.39					

Table 6 shows that t_{cal} = 1.05, df = 263, and t_{tab} = 1.96. Therefore, since $t_{cal}<t_{tab}$ and $P>0.05$, then there is no significant difference in how mentorship programs enhance the innovation capabilities of male and female business education students in universities in Rivers State. Hence, the null hypothesis two is retained at 0.05 level of significance.

Discussion of Findings

The study investigated how entrepreneurial mindset and innovation capabilities can be enhanced through mentorship programs among business education students in universities in Rivers State. However, the result in Table 1 showed that the grand mean of 2.00 and 2.18 for male and female respondents imply that both genders disagree on the level of mentorship programs among business education students in universities in Rivers State. Thus, the level of mentorship programs among business education students in universities in Rivers State is very poor. Furthermore, the result of Table 4 showed that there is a significant difference in the level of mentorship programs among male and female business education students in universities in Rivers State. The findings from this study are corroborated by previous studies by Benjamin and Onyeizugbe (2013) which revealed that effective learning and the growth of entrepreneurship in Nigeria are positively correlated, and mentorship is a good way to pick up entrepreneurial skills.

Table 2 shows that the grand mean of 3.41 for male students shows that the students strongly agree that mentorship programs can enhance the entrepreneurial mindset of business education students in universities in Rivers State, while the grand mean of 3.17 for female shows that the students agree that mentorship programs can enhance the entrepreneurial mindset of business education students in universities in Rivers State. Furthermore, the result of Table 5 showed that there is no significant difference in how mentorship programs enhance the entrepreneurial mindset of male and female business education students in universities in Rivers State. The finding from this study is corroborated by Michael (2021), who revealed that there is a significant relationship between business internships, business seminars and creativity and innovation among entrepreneurs.

Table 3 shows that the grand mean of 3.05 and 3.10 for males and females respectively show that both students agree that mentorship programs can enhance the innovation capabilities of business education students in universities in Rivers State. Furthermore, the result of Table 6 showed that there is no significant difference in how mentorship programs enhance the innovation capabilities of male and female business education students in universities in Rivers State. The findings from this study are corroborated by a previous study by Michael (2021), which revealed that there is a significant relationship between business internships, business seminars and creativity and innovation among entrepreneurs.

Conclusion

The study investigated how entrepreneurial mindset and innovation capabilities can be enhanced through mentorship programs among business education students in universities in Rivers State. This study concludes that mentorship programs have the potential to equally benefit both male and female business education students in developing their entrepreneurial mindset and innovation capabilities. This is hinged on the belief that mentorship provides valuable guidance, support, and networking opportunities that are essential for fostering an entrepreneurial mindset and enhancing innovation capabilities among students. Additionally, the findings suggest that gender should not be a barrier to accessing mentorship programs in universities, as both male and female students can benefit equally from these initiatives.

Recommendations

Considering the findings, the following recommendations are made:

1. Universities in Rivers State should prioritize the improvement of mentorship programs for business education students, particularly focusing on bridging the gap between male and female students.
2. Universities in Rivers State should continue to prioritize a wide range of mentorship programs to enhance the entrepreneurial mindset of business education students, regardless of gender.
3. Universities in Rivers State should continue to invest in a wide range of mentorship programs aside from industry mentoring to further enhance the innovation capabilities of business education students.

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ENTREPRENEURSHIP EDUCATION: A TOOL FOR REDUCING UNEMPLOYMENT AMONG BUSINESS EDUCATION GRADUATES IN RIVERS STATE UNIVERSITIES

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Abstract
One of the many pressing challenges facing Nigerian graduates today is youth unemployment with the ripple effect of their resort to violent crimes, cybercrimes amongst others. The concern of many educationists, government, curriculum planners and the public in general is to encourage youths to leverage in entrepreneurship. Entrepreneurship without exaggeration is the engine driving the economy of nations, creating new industries, young entrepreneurs, employments and wealth. However, entrepreneurship in Nigeria has been faced with a lot of challenges that limit entrepreneurial development. As such, there is need to handle these challenges skillfully, in order to have a smooth environment. Funding of entrepreneurship education should be taken seriously by the Federal Government. This can be achieved through increase in the budgetary allocation to educational sector. This paper examined *Entrepreneurship Education: As a tool for reducing unemployment among Business Education Graduates in Rivers State Universities.*
Keywords*: Entrepreneurship Education, Entrepreneurs, Unemployment Reduction, Business Education Graduates*

Introduction
Today, all over the world education is acknowledged as a platform for transforming and re-engineering individuals for productive living. As such it has become the desire of developing countries to have a functional educational programme that can equip graduates with the required skills, attitude and habits for self-reliance (Ogwunte, 2023). In the view of Koko and Owen (2023), education and training in Nigeria is beginning to take a new aspect as many people are driving and embracing it in totality. This singular act of being educated has resulted to enormous number of graduates from various universities. The perceptions of earning a living with university certificate after graduation has engendered Nigerian system of education and have also generated an increase in the number of unemployed graduates.
The issue of graduate unemployment cannot be overemphasized. Abiodun (2019) stated that today a large number of graduates from various institutions of higher learning are released into the labor market annually. In order to reduce the rate of unemployment among Nigerian number of graduates roaming about on the street with certificate qualification without having a meaningful source of livelihood, the concept of entrepreneurship education was introduced into tertiary education in Nigeria (Koko & Owen, 2023). It is as a result of the value placed on skills acquisition that led the Federal Republic of Nigeria through the National Universities Commission introduced entrepreneurship education to enable graduates acquire the required skills to become self-reliant thereby reducing the rate of unemployment.

Based on the outlined observation, the researcher believes that there is absolute need to identify how the adoption of entrepreneurship education can be useful for managing unemployment among Business Education graduates. To what extent can training in entrepreneurship at the graduate levels energise students towards personal job creation, employment in the public sector etc. Entrepreneurship entails the willingness and ability to seek out an investment opportunity, establish an enterprise based on this and run it successfully.

Ezenwafor and Okolochi (2021) perceived entrepreneurship as the process of using available capital in any form for business endeavors in an open and free-market economy for the sole purpose of doing new things within a new philosophy of values, purpose, utility, quality, and use that satisfies needs. In the view of Koko and Owen (2023) entrepreneurship education is an aspect of total educational system that involves the acquisition of skills, ideas and management abilities necessary for job creation.

Entrepreneurship is a way of thinking, reasoning, and acting that is opportunity-driven, holistic in approach, and leadership-balanced. Entrepreneurship, simply put, is the process of becoming an entrepreneur (Ikpesu, 2020). According to Amesi (2021), entrepreneurship is all about how individuals in an organization pursue opportunities without regard to the resources they currently control. Entrepreneurs mobilize and utilize human, financial, and material resources to meet unmet market needs and, through their entrepreneurial acumen, enjoy independence and reap financial returns as they contribute to the economy. Entrepreneurship is a deliberate, planned process of actions directed towards improving the economy of a nation through the strategic creation and multiplication of jobs and employment for prospective entrepreneurship education graduates.

In the opinion of Gautama and Singh (2015), an entrepreneur is anybody who can convert profitable ideas into action. It includes risk-taking, innovation and creativity as well as the ability to plan and manage projects to achieve objectives. Therefore, an entrepreneur is an individual who identifies a business opportunity through strength, weakness, opportunity and threat (SWOT) analysis within his environment and takes advantage of the situation to make a profit. Amesi (2021) sees an entrepreneur as an individual who is willing and able to take business risks with the aim and objective of making profit. Amesi buttressed that entrepreneurs are people with entrepreneurial spirits. People with entrepreneurial spirits are likely to have knowledge, skills, ability to create, and innovative requirements that are unique and different from others.

The implications of pursuing an education in entrepreneurship before and after graduation are listed below:

1. It increases wealth creation, which may result in an increase in GDP
2. Items will be sold at a lower price and delivered to the underprivileged at a lower cost.
3. Graduates will be able to interact and learn from this, which will improve teaching and learning.
4. The graduates will become experts in the production of bleach, perfumes, detergent, barbering, tailoring, business centers, and other products thanks to their knowledge of entrepreneurship education.
5. The graduate can use the knowledge gained from entrepreneurship to effectively interact in the job market.
6. The graduates will be better able to communicate with, record, and store information thanks to this.
7. The graduates of entrepreneurship education will be able to open secondary schools, nursery/primary schools, additional moral lessons, etc. , which will be beneficial to society and allow them to generate income that will contribute to sustainable development.

Entrepreneurship education refers to education given to people with a view to developing entrepreneurial qualities, followed up with support services for smooth operation and successful business running (Orluwadare, 2015). Entrepreneurship education seeks to provide students with the knowledge, skills, and motivation to encourage entrepreneurial studies in a variety of settings (Amesi & Akpomi, 2017). Entrepreneurial education creates enormous and considered to be economic development of any society by a way of identifying business opportunities and training manpower with innovative enterprise skills grasp the opportunities for starting new Entrepreneurial activities. Koko and Owen (2023) explained that entrepreneurship education is important to the development of human resources, impartation of appropriate skills, knowledge and attitudes. It is the road for transformation, industrialization and major way to world knowledge economy, as the graduates will become creative and self-reliant.

Entrepreneurship education simply put together is the ability an individual has to be fully equipped with the necessary skills needed to be self-reliant. The unemployment situation in the country is alarming and this clearly necessitates the involvement of graduates from different institutions of learning in the country in entrepreneurship education that will enable them to be self-employed. There is an urgent need to eradicate this situation of unemployment and to allow sustainable growth and development to take place (Okoro, 2022). In the same vein, Okonkwo (2015) states that entrepreneurship education is directed at developing understanding and capacity for pursuit of entrepreneurial behaviours, skills and attributes in widely different contexts. Entrepreneurship education is a skill acquisition programme which equips its recipients to be self-employed, innovative, creative and resourceful. It is pertinent to expose all business education students and graduates to entrepreneurship education which will help them to start their own businesses in future. Entrepreneurship is aimed at equipping graduates with the relevant knowledge to spot, create, establish and manage business enterprises. It is an important agent of change in the development and growth process of an economy

Entrepreneurship education has been recognized globally as an effective tool for the actualization of self-employment, poverty reduction, and job creation (Ogwunte, 2023). Entrepreneurship education involves learning a variety of business-related competencies for business development and management. Such learning includes improved decision-making skills, identification and utilization of business opportunities, setting up and properly running an enterprise, and recently, skills to access information and use different information and communication technology (ICT) tools to create a better working space (Duruamaku-Dim & Duruamaku-Dim, 2014). Amesi and Akpomi (2017) explained that entrepreneurship education seeks to provide students with the knowledge, skills, and motivation to encourage entrepreneurial studies in a variety of settings.

Entrepreneurship education is a form of education which makes humans to be responsive to their personal, families and national needs and aspirations. Entrepreneurship competencies carry with it, the concept of skills and mental awareness which are needed to understand the functioning of an already existing business. Entrepreneurial Education could lead to capacity building of the beneficiaries mentally, physically and intellectually thereby placing them on the advantage of acquiring, interpreting, extrapolating information and consequently applying such capacities in building self, in particular and the nation in general. Entrepreneurship education is about developing attitudes, behaviours and capacities at the individual level. It is also about the application of those skills and attitudes that can take many forms during an individual's career, creating a range of long-term benefits to society and the economy (Anho, 2014). Luca, Alaka, and Odozi (2014) observed that entrepreneurship education plays numerous roles in the lives of individuals, including graduates and these roles are as follows:

1. It can positively impact a learner at all levels in a wide number of contexts. This explains why there are such a wide variety of entrepreneurship education programs, all of which can provide important outcomes at various stages of a learner's life.
2. It is a key driver of the economy and wealth, and a high majority of jobs are created by small businesses started by entrepreneurially minded individuals. Thus, it would make learners relevant in today's economy.
3. It develops good support skills, including commenting, decision-making, interpersonal abilities, economic understanding, digital skills, marketing, managerial, and financial skills.
4. It inculcates in learners the mentality of hard work, one of the keys to unlocking poverty doors and developing rural areas.

The roles of entrepreneurship education to the development of individuals are numerous and cannot be overemphasized. It is a veritable stool for human empowerment and development of a nation's economy.

Goals and Objectives of Entrepreneurship Education

The overall objectives of Entrepreneurship education is to continuously foster entrepreneurship culture amongst students and faculty with a view to not only educating them but to also, supporting graduates of the system towards establishing and also maintaining sustainable business ventures, including but not limited to those arising from research. Ajudeonu (2014) outlined the goals of entrepreneurship education to include:

1. To provide meaningful education to youths, which could make them self-reliant and subsequently encourage them to derive profit and be self-dependent.
2. To give training and impact necessary skills to individuals to be self-reliant.
3. To provide graduates with training in skills that will make them meet the manpower need of the society.
4. To provide small and medium sized companies with opportunities to receive qualified graduates who will receive training in the skills relevant to the management of the small business centers.
5. To generate wealth, spread prosperity and encourage grassroots development

The Purpose of Entrepreneurship Education

In the view of Okoro (2022), Entrepreneurship Education seeks to provide the individuals with the knowledge, skills, creativity, new ideas, and motivation that will enhance entrepreneurship success in a variety of settings. Entrepreneurship Eucations have the following in view;

1. To provide the individual, graduates with the functional education that will guide them towards being self-employed and self –oriented.
2. To provide the youths and graduates with adequate training that will stir up in them the creativity and innovativeness in identifying novel business opportunities.
3. To serve as an accelerator of economic growth.
4. To provide university graduates with adequate training in risk management, thereby reducing business risks and making their bearing certain and feasible.
5. To reduce poverty rate, insecurity and violent crimes.
6. To create employment opportunities for citizens.
7. Reduction of rural to urban migration.
8. To provide the young graduates with enough training and support that will enable them to establish a career in small and medium size businesses.
9. To instill the spirit of persistent determination in the youths, graduates, adults, individuals which will strengthen them to persist in any business venture they embark on.
10. To create a smooth transition from traditional to modern industrial economy.

Benefits of Entrepreneurship Education

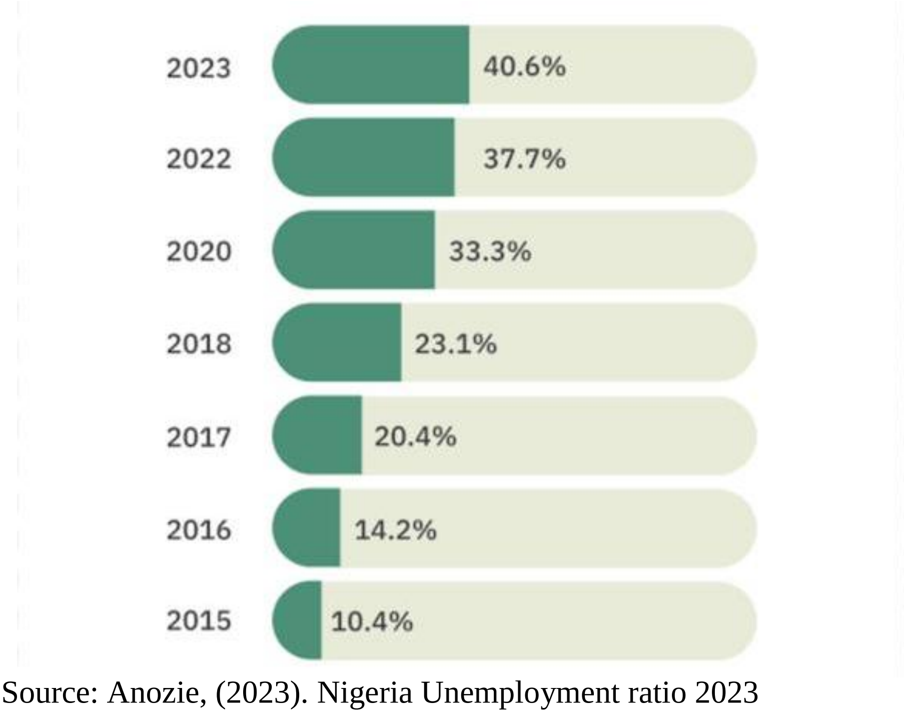
1. Entrepreneurship education provides individuals with adequate training that will enhance creativity and innovation, thereby encouraging self-employment and self-reliance.
2. Entrepreneurship education enables employment opportunities to be more readily available because the operators have a good knowledge and understanding of the small businesses.
3. Entrepreneurship education enables entrepreneurs to be empowered to tap from local resources in their immediate environment.
4. Entrepreneurship education inculcates in learners the mentality of innovations and hard work.
5. Entrepreneurship education inculcates into the graduates creative spirit that will help them to succeed in their businesses.
6. Entrepreneurship education creates avenues for graduates and potential entrepreneurs to utilize new ideas manage the entrepreneurial process for effective results.

7. Entrepreneurship education provides opportunities to appreciate local technology.
8. Entrepreneurship education equips individuals with the traits of being creative, innovative, independent and resourceful for self-reliance.
9. Entrepreneurship education helps the learners to be relevant in the society thereby increasing economic growth.
10. Entrepreneurship education provides relevant results at various stages of the learner's life.

Concept of Unemployment

Unemployment is a phenomenon that arises when members of a country's labor force are unable to obtain their goals of participation in a gainful occupation due to a situation in which the supply of labor significantly exceeds demands for it (Eya, 2022). Due to declining growth and the global economic meltdown, the employment situation in Africa, especially in Nigeria, has become critical. Unemployment among graduates is one of the serious socio-economic problems confronting many developing countries in Africa. Some of the major causes of unemployment are skill mismatches and a lack of employment opportunities. Anum and Shaibu (2021) described unemployment as the situation in which people who are able and willing to work cannot find any. Individuals who are unemployed are often more susceptible to several challenges, including difficulty finding future employment and a decrease in income.

Unemployment refers to the proportion of those in the labour force (not in the entire economic active population nor the entire Nigerian population) who were actively looking for work but could not find work for at least 20 hours during the reference period to the total currently active (labour force) population (NBS, 2015). This means that one is unemployed if he or she did absolutely nothing at all or did something but not for up to 20 hours in a week. In an economy, the unemployment rate is the number of persons unemployed expressed as the percentage of the total labour force. The total labour force is the number of people employed plus the number of people unemployed within the ages of 18 - 60 years. The level of unemployment rises when the inflow (the newly absorbed) exceeds outflows (persons getting new jobs or quitting the labour force altogether (Adam, 2017). The statistics below shows the continuous rise of unemployment in Nigeria.



Source: Anozie, (2023). Nigeria Unemployment ratio 2023

The different categories of unemployed persons are: sacked people or redundant ones (job losers); temporarily laid off but eventually being retired by the same organization; while some people voluntarily quit their present jobs. Besides, inflow to unemployment can also come from people not previously in the labour force such as school leavers (Idada & Miami, 2014). Unemployment occurs when people are without jobs and they have actively sought for jobs within the past four weeks (Okafor, 2011). Unemployment refers to a situation where people who are willing and capable of working are unable to find suitable paid employment (Fajana, 2020).Unemployment is a situation in which people who are willing to work at a prevailing wage rate are unable to find jobs. It is one of the macro economic problems which every responsible government is expected to monitor and regulate. The higher the unemployment rate in an economy the higher would be the poverty level and associated challenges.

Business Education is a course that prepares students for entry into advancement in jobs within business and it is equally important because it prepares students to handle their own business affairs and to function intelligently as consumers and citizens in a business economy (Koko & Chike, 2020). Business Education refers to the study of courses that are technology related and the acquisition of functional and practical skills required to function efficiently and effectively as employees or employers of labour (Titiloye, 2012). Business Education is a programme designed for the purpose of providing individuals with the right practical, vocational and business attitudes, skills understanding, values and knowledge, that will make them perform effectively in any given society (Ubulom & Ogwunte, 2017).

Business Education programme is basically designed to prepare graduate to be self-reliant, competent, skilful, technically sound and knowledgeable for the purpose of performing efficiently and effectively in the workplace (Tiwari, 2022). Business education is concerned with the process of developing job-related behaviours in learners so as to improve their performance. However, the content of the programme curricula does not totally match with the purpose of the programme as the content of the curriculum is more theoretical than practical. Dike (2019) sees the programme as a process that is concerned with opportunities to educate students in disciplines that are educational and business related. Business Education is an important part of general education because it emphasizes the acquisition of skills and competencies for use in office and business-related occupations (Amesi & Nkoro, 2020). Business Education is a program originally designed to offer students the opportunity to develop the desired abilities, skills, and understanding of the vocational opportunities available in the world of work (Akpomi & Kayii, 2020). Business Education is a program of study that prepares its recipients to be functional in the world of work by adapting to change in the environment

Entrepreneurship Education and Reduction of unemployment

Human development will be grossly undermined and impaired without employment. To avoid this situation, there is need to promote small and medium scale enterprises through entrepreneurship education which prepares individuals by ways of skills and knowledge acquisition that empower them to set up productive ventures that engage the entrepreneurs and others thereby reducing unemployment and poverty which has many manifestations and dimensions in Nigeria, such as joblessness, over indebtedness economic dependency, lack of freedom, inability to provide the basic needs of life for self and family, lack of access to land and credit and inability to save and own assets (Nwabufo & Joshua, 2015).

Nigeria has a new economic order which is embodied in Obasanjo socio-economic transformation agenda entitled: National Economic Empowerment and Development Strategy (NEEDS), which has four key objectives as follows; poverty reduction, employment generation, wealth creation, and value reorientation. For these objectives to be achieved, entrepreneurship education has to be effectively implemented. Its adoption and adaptation will go a long way to transform the Nigeria economy since individuals are taught different skills that empower them to become job creators, venturing into and modified areas of productive activities as already mentioned (Nwabufo & Joshua, 2015).

In Singapore, the unemployment situation has reduced because people find it less difficult to be gainfully employed after getting vocational training which is compulsory for every secondary school leaver, Thus, for Nigeria to sustain her economic growth there is need to develop the human resources through technical, vocational and entrepreneurship education (Nwabufo & Joshua, 2015). If possible the Singaporean model of compulsory nationals skills acquisition program after secondary school education should be adopted to enable our abundant human capital acquire the relevant skills, knowledge and values responsive to the changing needs of school leavers, industry and community for sustainability and national development, Our youths need to be equipped with skills that are required to operate successful businesses. Technical skills are expected to be supported by entrepreneurial skills to be able to succeed in any business. Therefore, let the graduates of tertiary institutions in our country be mobilized for skills acquisition and entrepreneurial development to enable them embark on small and medium scale enterprises which are the largest employers of labor at the lowest cost in developed nations.

Information communication and technology (ICT) are paramount in this digital era as one of the entrepreneurial skill acquisitions required of Business Education graduates as a panacea to unemployment challenges. It enables graduates to achieve better knowledge, ideas and entrepreneurial capabilities to run more efficiently and reach market that were out of reach. ICT skills are important to graduate because it enables them to make their living and also put food on their table because it yields income once managed effectively and efficiently. Graduates should be used to the skills that will equip them both for employment and self-employment because it is becoming more valuable due the changes in the labour market demand and self-employed for entrepreneurial development. Entrepreneurial skills make an individual to be successful in innovation, creativity and possess of enterprise (Jim, 2022). For individuals to achieve personal skills as entrepreneurs; they must be courage, self-determinant, responsibility, perseverance, productive, approach and commitment.

Problems facing entrepreneurship Education and its Graduates in Nigeria

Running entrepreneurship is relatively not easy. Balogun and Olatoro, (2022) submitted that entrepreneurships in Nigeria have a lot of problems. Entrepreneurship is faced with several constraints which limit its development. Some of the challenges are:

1. **Inadequate capital:** capital is one of the problems encountered by Nigeria Entrepreneurs. As a result of insufficient capital, entrepreneurs are not able to carry out all the beautiful project/ideas that they may have formulated. Borrowing from banks and other financial institutions have not been very easy as very stringent conditions are required for the entrepreneurs. This has greatly affected business development.
2. **Government Policies:** Most time government comes up with certain policies that may not be in the interest of the entrepreneurs. This could either be in form of restriction on certain key raw materials or outright ban, withdrawal of subsidies, increase in taxes etc. These policies can affect business operation.
3. **Lack of awareness of business opportunities:** Sometimes, entrepreneurs are not aware of business opportunities available to them; this is because most entrepreneurs do not know how to seek for business opportunities. Most of them depend on their intuition and what is obtained within their immediate environment, which may not be enough.
4. **Management Control:** The employment of incompetent and low quality staff can affect the features of a business. When a worker is incompetent, his output would surely be poor. Most entrepreneurs have no effective control over their workers due to the fact that most of the employees are well known to them.
5. **Production of substandard goods:** It has been noticed that most entrepreneurs are in the habit of producing substandard goods. This is because they may not have the technical know-how or the resources to make better products. These problems possess a lot of setbacks to the entrepreneurs owing to the fact that they will not be able to compete with their foreign competitors.
6. **Falling economic trends:** The prevailing economic situation in Nigeria have the potentials of affecting business activities. These include price change, market demand, inflation etc. An increase or decrease in each of these variables can affect business operations as well as the fortunes of the entrepreneurs.

7. **Lack of adequate infrastructural facilities;** like electricity, water supply, good road etc. that will ensure smooth operation of the entrepreneur's business activities.
8. **Lack of strong patent law:** A serious challenge that entrepreneurs face in Nigeria is the level of competition from foreign producers. The local entrepreneurs are not protected, the situation is worsened by the apparent lack of faith in the Nigeria patent law which many entrepreneurs feel offer them little protection against piracy.
9. **High cost of doing business in Nigeria:** Entrepreneurs are in business (take risk) because they want to make profit, where the expected returns from a venture are lower than the opportunity cost; it will act as a disincentive for the entrepreneur. Due to collapsed infrastructural facilities and unbridled corruption, where entrepreneurs have to spend huge sums to provide some basic infrastructure and bribe government officials, it makes the cost of doing business in the country to be too high with adverse implications for profitability

Conclusion

Entrepreneurship education is very important that there is urgent need for all higher educational institutions in Nigeria to comply with the presidential directives to the effect that entrepreneurship be made compulsory for all students of higher education institutions in Nigeria, irrespective of their areas of specialization. This policy decision was based on government awareness of the crucial role of entrepreneurship education and training in fostering employment generation among the teaming youths, economic growth, and wealth creation. Thus, entrepreneurial skills goes beyond training and education, it involves a process of human capacities building through formal and or informal training inculcating in the entrepreneur basic skills such as financial skills, technical skills, creative skills, managerial skills, intellectual skills, marketing skills, communication skills and technological skills.

Suggestions and way forward

In the light of the issues discussed above, the following suggestions are proffered.

1. Funding of entrepreneurship education should be taken seriously by the Federal government. This can be achieved through increase in the budgetary allocation to educational sector.
2. Entrepreneurship education should be inculcated into the school curriculum to promote human empowerment and development through entrepreneurial skill acquisition. It is a means of reducing unemployment since it is skilled oriented and employment motivated. All school programmes should be geared toward providing entrepreneurial skills.
3. The private partners and Non-Governmental Organization (NGO) should be encouraged to participate in entrepreneurship education through funding. This involvement should be seen by firms as a long term investment, and as an aspect of their corporate social responsibility to the nation.

4. To empower youth, Federal government should provide enabling environment and all the necessary equipment and materials for easy teaching and learning entrepreneurship education needed for economic enhancement and youth empowerment in Nigeria.

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CORRELATES OF ENTREPRENEURIAL INTENTIONS OF BUSINESS EDUCATION GRADUATING STUDENTS IN RIVERS STATE

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Abstract

The study examined entrepreneurial intentions of Business Education graduating students in Rivers State, visa-a-via individuals' psychological factor, family background and social environmental factors as correlates of entrepreneurial intention of business education graduating students. Consequently, the study examined the relationship between individuals' psychological factor, family background, social environmental factors and entrepreneurial Intentions of business education graduating students in Rivers State. Three research questions and three hypotheses guided the study. The population of 875 Business Education graduating students was used for the study. Random sampling technique was adopted in selecting 275 Business Education graduating students as the sample size for the study. Two sets of structured questionnaires; Entrepreneurial Intentions of Business Education Graduating Students Questionnaire (EIBEGSQ) and Correlates of Entrepreneurial Intention of Business Education Graduating Students Questionnaire (COEIBEGSQ) were used for data collection. The result of the research revealed acceptance of the hypothesis one, hypothesis two was rejected and hypothesis three also revealed rejection. The result of the findings revealed no decision to start business by graduating students because of low motivation from family, government and other institutions. The study recommended motivation from family, government and institutions, as a support to the graduating students as well as providing graduating students with starter pack in their skills interest area, as a motivational tool from institutions.

***Keywords*:** Entrepreneurial Intention, Business Education, Individual's Psychological Factor, Family Background, Social Environmental Factor.

Introduction

Entrepreneurship education emphasis has been on the need to motivate students to create ideas on marketable products while in school which is the realization of the value of entrepreneur and has brought about the concept of entrepreneurship. According to Thuo, Abo and Toma (2016), policy makers in many developing countries recognize that entrepreneurship could stimulate rapid growth and structural changes in the economy. The popularity of entrepreneurship has been due to its effect as catalyst for wealth creation and employment opportunity which enabled the most developed and developing countries recovered from economic crises by developing their entrepreneurial spirit, meaning they paid more attention to entrepreneurial education and brought innovation into business sector. Therefore, entrepreneurship is seen as the process of doing something new and different with the aim of creating opportunity for individuals and adding value to the society.

Entrepreneurial intention is a psychological state that guides individual attentions towards specific business goal, in order to achieve entrepreneurial results. It is the recognition that individuals take action to develop new business or create new values in existing enterprise activities and promote economic and social development. Entrepreneurial intentions is important, hence it plays a central role in the entrepreneurship process. This is because it is that starting stage and the incentive of entrepreneurship that encourages individual to start the new business (Asamani & Mensah, 2013). Graduated student's entrepreneurial intention generally is seen as a conscious awareness and conviction that intend to set up a new business venture.

However, government intervening with the absence of entrepreneurial ideology could be detrimental to a country economic development. Hence understanding graduating students, entrepreneurial intentions is critical in developing more effective entrepreneurship educational programmes at the university level. Ali, Topping and Tariq (2010), stated that participating in entrepreneurial programme improve university students entrepreneurial attitudes, meaning that entrepreneurial education can change students perceptions by creating awareness and providing them with complete skill sets to start a new business. Student, who intends to establish sustainable business, will have positive attitudes towards sustainable entrepreneurship. Hence Asamani and Mensah in Thuo et al (2016) opined that, institution of higher learning have been in the fore front in providing students with the entrepreneurial knowledge and skills, therefore making educational process have impact on students entrepreneurial intentions. For example, in countries like Ethiopia, educational process could make impact on entrepreneurial intention, by motivating individual's ability to ventures into business ideas created while in college and university levels.

This trend can now explain the increasing awareness of exposing individual intention to create new businesses and also agree that formal employment is no longer guaranteed especially in the public sector for university graduates. This is in line with Keat, and Selvarajah, (2011) statement, proving the fact that designed curriculum in most institutions do not provide graduates with adequate entrepreneurial education or skills, meaning education is orientated towards formal employment in the public sector. Graduating students, therefore focus largely on government employment, beside innovativeness or generation of new ideas, which also, will be problematic in the business sector, as proving by a study conducted by the Global Entrepreneurship Monitors (GEM). This study revealed that over 75% of the products or services were not new to customers, meaning lack of innovativeness and resentment to economy.

For graduating student's entrepreneurial intentions to be actualized, entrepreneurial mind set is needed in the society, including Rivers State This will help in motivating students on entrepreneurship intention by teaching them perseverance, tenacity, creativity, problem solving and collaboration. So they can identify problem and find solution in the environment they belong which is important, in that it plays a central role in the entrepreneurship process which is the starting stage and the incentives of entrepreneurship that encourages individuals to start their new business. Moreover, it enables them become viable entrepreneurs that can develop a strong and vibrant entrepreneurial community with the present growth and transformation plans, steaming the government to paying more attention to entrepreneurship, especially in the development of Small and Medium Enterprises (SMEs) to create employment opportunities (Feola, Vesci, Botti & Parente, 2019).

Thuo, et al, (2016) reported that government seeks to increase effort to give timely and quality information to their capacity on development of entrepreneurs for wealth and job creation. This effort has been made possible through funding by United Nation Development Programme (UNDP), Micro Soft East African partnership to support young entrepreneurs through trainings on" Build your Business" which aim at developing knowledge and skills for starters and existing small enterprises. This concept propels the National Universities Commission (NUC) directive in all universities in Nigeria, including Rivers state universities to include in their curriculum as compulsory, entrepreneurship studies (Koko, Ikpesu & Obayi, in Koko, 2015).

They further, opin that the main objective of this enactment was to prepare the students for life outside white collar job after graduation, but some universities in Nigeria are still struggling to catch up with this new developed curriculum review, which incorporates entrepreneurial studies.

Consequently, Business Education as a programme of study has made an impact in the social economic development of Nigeria, through entrepreneurship education (Koko, 2019). The benefits of Business Education training have been acknowledged globally, thus research uphold the immerse contributions of Business Education training to the development of the nation and this is underscored by the conscious provision of qualitative and functional higher education to provide opportunities for the acquisition of knowledge in the area, even in entrepreneurial opportunities (Abdullahi , Soyode, Zeb-Obipi in Koko, 2019). According to Abdullahi in Koko (2019), Business Education is a social investment which yields large returns not only to education, but also to the social betterment of the people in Nigeria, so as to develop other segments of the economy. Generally, the acceptance of the concept that products of Business Education stands a better chance of acquiring employment immediately after graduation, for contribution to social economic development of the individual and community is indisputable. This statement was supported by koko's input, stating that separate works observed by Business Education, is that its trainings promotes instant employment through self-employment for graduates and to prevent unemployment and its ability to produce self-employed individuals capable of becoming employers of Labour (Koko, 2019). Therefore, interaction with the outside world is a key aspect of entrepreneurial education and entrepreneurial unit is the channel for facilitating educational institutions interaction with the outside world at University level (Akpomi, 2021).

The correlates of entrepreneurial intentions have been considered and they include Individual psychological factors, Family background and social environmental factors. The individual Psychological factor explains how individual decision is made on entrepreneurial intentions as a mental orientation such as desire, wish and hope, influencing their choice of entrepreneurship, using individual expectation, preference, plan and behavioral anticipation. The impact of individual gender on their entrepreneurial intentions finds that males have stronger intention than females because of their low self-efficacy. The female may avoid starting their own business for lack of necessary capability (Fielden, Davidson, Dawe & Makin in Zhengxia, Genshu & Hui, 2012). Some of the reasons were as a result of the responsibility of supporting the family in raising the children, which may have negative influences on female entrepreneurial intentions. Researchers like Lee, Wong, Foo and Leung (2011), focus on personality traits as an important factor, comparing with other entrepreneurs traits, such as strong achievement orientation, strong individual control, willingness. But other researcher like Gartner (1985) holds that those personality traits cannot be taken as an effective explanation of their choice of starting business. Zhengxia (2012) pointed out that individual attitudes constitute the important influencing factors of their entrepreneurial intentions; they argued that individuals' entrepreneurial intentions are also impacted by their subjective norm which is influenced to him or her through relative, parents, friends, colleagues and so on to their certain behavior and individual obedience to those expectation.

Since entrepreneurial intentions is the psychological state that guides students attention toward specific business goals in order to achieve entrepreneurial result. It is also important to recognize that students take actions to develop new business idea, create new values in existing enterprises, such that parent behavior would set examples to influence children entrepreneurial intentions and make them become entrepreneurs (Krueger & Dickson in Zhengxia, Genshu & Hui, 2012). The intention of an individual to start a business that can be considered as an important phase in the entrepreneurial process and the relationship between the self-efficacy of individual entrepreneurship and their entrepreneurial intentions has been verified, some argued that individual judgment on starting a business comes from judgment on their self-efficacy of implementation and planning their entrepreneurial behavior. Zhengxia, et al (2012), states that self-efficacy influence not only the formation of individuals, entrepreneurial intention, but also the possibility of creating a firm in the future. According to Garzon in Zhengxia, Genshu and Hui, (2012), individuals entrepreneurial competence, plays a determinant role in the early stage of starting a business.

Mcclemand in Zhengxia Genshu and Hui (2012) indicates that adult's entrepreneurial intentions can be predicted by the entrepreneurial competence in their childhood.

The psychological state of an individual is associated with the subjective state of entrepreneur's attention, energy and behavior oriented to specific goal. The decision to build a new business is considered as a thoughtful thinking activity and planed behavior of entrepreneur. Thereafter, individuals entrepreneurial competence and their impact on entrepreneurial intentions from different perspective, competence are the integrated abilities by which entrepreneurs succeed in implementing entrepreneurial activities, including opportunity competence, relationship competence, conceptual competence, organizations competence, strategic competence and commitment competencies. The benefits of individual factor, on entrepreneurial intention are that it has a positive impact on the entrepreneurial behavior, meaning individual with entrepreneurial intention are more likely to carry out entrepreneurial behavior. Even at present, a large number of researches on entrepreneurial intention pinpoint that students entrepreneurial competence refers to their leadership, curiosity and entrepreneurial skills which are correlates of personality trait and family's education. The Impact of family background factors on individual entrepreneurial intentions as explained will depend on the kind of family you come from and family educational level. It is also referred to such as your social and racial origins, your financial status or types of work experience that you have in your family. Family background influences person entrepreneurial intentions through promoting entrepreneurship attitudes. Family members' involvement in entrepreneurial activities can influence individual intention in venturing, and creation of their own business and also view as strength. The role parents play as regards to their children entrepreneurship, according to Steeir and Arregle (2007) is paramount. The family members act as positive educational models, which can contribute to starting a business and successfully managing the business and equally teach knowledge and values that are handed down to the children to become human and social capital. Entrepreneurship becomes a family business when family enterprise is more indicatively practiced within a family or a portfolio of business or initiatives that family may be involved. It is more holistic approach to understanding in many ways in which a family and business drive entrepreneurial activities and behavior. Family background mainly is seen as social, economic, cultural and welfare characters of a family, which has been proved by continuity in an environment (Douglas, 2016).

In our society, social environmental factor refers to immediate physical and social setting in which people live or which something happens or develops. It includes the culture of individual, educational status or environment lived in and the people and institution with whom they interact. According to urban and Hummen in Zhengxia, Genshu and Hui, (2012), explanations on social environmental factors like legal rules, government support as an important factors influencing individuals' entrepreneurial intentions. Scholars indicate that social environmental factors are an adjusting variable that has impact on individual entrepreneurial intentions by interacting with individual attitudes mentioned above; there are both supporting and hindering factors. This is in line with Amesi (2015) definition on environment, as the sum of the external forces that influences the individual business and communities. Amesi (2015) further stated that the environment is something that lies outside the business organization or system. The environmental factors can be regarded as a fixed constraint for the Entrepreneur, since entrepreneurs cannot control it nor do anything about it, but at the same time the environment matters for the entrepreneurs, relative to the attainment of its objectives.

The business environment is an environmental factor that consists of the agencies, organizations and all factors outside the firm and its control, including the customers. Business and environment exist on a common relationship; hence business is a product of environmental influences. The environmental factors are constantly changing and so to survive and progress, business must also change (Amesi, 2015). The entrepreneurial intention vision includes creating opportunities for entrepreneurship, creating jobs, employment opportunities in the society, engaging in social welfare service of redistributing income and wealth. Transforming standard working procedures into a more modern approach is the process of recognizing and resourcefully pursing opportunities to create social value.

Social factor helps on innovation, resourcefulness and result oriented. Social factor is the process that help entrepreneurs to tailors their activities to be directly tied with the ultimate goal of creating social value. In doing so, they often act with little or no intentions to their personal profit. Entrepreneurship applies social principle and guidance used by startup founders and entrepreneur to a business that directly generate social changes or impacts a social cause.

An entrepreneur is primarily motivated by the desire to alleviate some kind of systematic social or cultural problem. The important of social environmental factors is that, a well-designed social environment help to foster positive peer relationship, create positive interaction between and provide opportunities for adults to support children in achieving their social goals. The said environmental factor, psychologies and family background put together are correlates of entrepreneurial intention of Nigeria students as a reaction of the environment, which is felt by both entrepreneurs and the business. This is because neither of them acts in a vacuum, as such the entrepreneurs and business has to relate in one way or the other. Based on these factors, the study provides a comprehensive analysis on the relationship between individual Psychological factors, family background and social environmental factor of entrepreneurial intention of business education graduating students in Rivers State.

Statement of the Problem

In recent years there has been an increasing emphasis on the implementation of entrepreneurial programmes at the university level, without minding students' skills interest on the programme. However the intentions of the students are correlated either by individual interest, family interest or environmental interest on the achievement of their entrepreneurial programme while in the university. The inability to explore students' interest on the skills available has often produced low performances from the graduating students' entrepreneurial practice in Rivers State. This has brought about high unemployment in the state; hence the essence of entrepreneurial programme is not achieved by the higher institution. In order to promote the entrepreneurship amongst graduates and reduce employment rate with entrepreneurship, it is necessary to explore the entrepreneurial intentions of Business Education graduating students in Rivers State.

Purpose of the Study

The major purpose of the study is to examine the correlates of entrepreneurial intentions and Business Education graduating students in Rivers State, Specifically the study sought to:

1. Examine the relationship between Individual Psychological factor and entrepreneurial intentions of Business Education graduating students in Rivers State.
2. Examine the relationship between Family background factor and entrepreneurial intentions of Business Education graduating students in Rivers State.
3. Examine the relationship between Social environmental factor and entrepreneurial intentions of Business Education graduating students in Rivers State.

Research Questions

The following research questions guided the study.

1. What is the relationship between the individual psychological factor and entrepreneurial intentions of Business Education graduating students in Rivers State?
2. What is the relationship between family background factor and entrepreneurial intentions of Business Education graduating students in Rivers State?
3. What is the relationship between social environmental factor and entrepreneurial intentions of Business Education graduating students in Rivers State?

Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance;

1. There is no significant relationship between individual Psychological factor and ` entrepreneurial intentions of Business Education graduating students in Rivers State.
2. There is no significant relationship between family background factor and entrepreneurial intention of Business Education graduating students in Rivers State.
3. There is no significant relationship between social environmental factor and entrepreneurial intention of Business Education graduating students in Rivers State.

Methodology

Correlational research design was adopted for the study. This research design is deemed appropriate because it is used to examine the relationship between two variables. The study was carried out in Rivers State, Nigeria. The population of the study consists of eight hundred and seventy-five (875), Business Education graduating students in Rivers State University and Ignatius Ajuru University of Education, all in Rivers State (2021, 2022) section. The random sampling technique was adopted and 275 Business Education graduating students were drawn from the total population as the sample. Two sets of self-structured questionnaire titled: Entrepreneurial Intentions of Business Education Graduating Students Questionnaire (EIBEGSQ), Correlates of Entrepreneurial Intention of Business Education Graduating Students Questionnaire (COEIBEGSQ) was used for the study. The instrument consists of two sections A and B. The A part contains information related to the variables, individual/ psychological factor, family background factor and social environmental factor, with five questions each, making 15 (Fifteen) items, while questionnaire B, contains information's on entrepreneurial intentions of Business Education Graduating students in Rivers state, with 8 key items which were designed based on four point rating scale of Strongly Agree (SA-4points), Agree (A-3points), Disagree (D-2points) and Strongly Disagree (D-1point). The instrument was subjected to face and content validity by 3 experts; 2 from the department of Business Education and an expert in Measurement and Evaluation, all from the Rivers State. Test re-test method was used to test the reliability of the instrument and data generated was analyzed using Pearson Product Moment Correlation (r) to ascertain reliability co-efficient 0f .72. The data was done using Pearson Product Moment Correlation to test the hypothesis, while the correlation coefficient was used to answer the research questions. The hypothesis was tested with the significant (r). The decision for the research question was based on the cutoff point of 2.50 equal and above to be accepted, while below 2.50 was rejected. The decision for the testing of the hypothesis was based on the calculated value lesser than the table value is retained otherwise rejected.

The level of relationship was determined based on these boundary limits:

3.50- 400 = Very strong relationship

2.50-3.49 = Strong relationship
1.50-2.49 = Moderate relationship

0.50-1.49 = Weak relationship

Results

Table 1: Research question 1: what is the relationship between the individual/psychological factor and the entrepreneurial intentions of business education graduating students in Rivers State.

Variable	∑X ∑Y	$∑X^2$ $∑Y^2$	∑XY	t-cal	r-cal	Level of Relationship	Decision
Individual psychological factor (x)	4.34	3.86					
Entrepreneurial intention of business education graduating students in Rivers State (y)	3.61	3.62	3.18	0.15	1.968	Weak relationship	Rejected

Source: Field Survey, 2024

The analysis in the Table 1 proves that the total value of the t-cal is 0.15 while r-crit is 1.968 which indicates that there is weak relationship between individual/psychological factor and the entrepreneurial intention of business education graduating students in Rivers State Universities.

Table 2: Research question 2: what is the relationship between the family background factor and entrepreneurial intentions of business education graduating students in Rivers State .

Variable	∑X ∑Y	$∑X^2$ $∑Y^2$	∑XY	t-cal	r-cal	Level of Relationship	Decision
Family background factor (x)	3.33	2.24					
Entrepreneurial intention of business education graduating students in Rivers State (y)	3.61	2.66	2.38	0.6	1.968	No significant relationship	Accepted

Source: Field Survey, 2024

The analysis in the Table 2 proves that the total value of the t-cal is 0.6 while t-crit is 1.968 indicating no significant relationship between family background factor and entrepreneurial intentions of business education graduating students in Rivers Universities.

Table 3: Research question 3: what is the relationship between the social entrepreneurial factor and entrepreneurial intentions of business education graduating students of Rivers State.

Variable	∑X ∑Y	$∑X^2$ $∑Y^2$	∑XY	t-cal	r-cal	Level of Relationship	Decision
Social environmental factor (x)	3.51	3.07			1.968		
Entrepreneurial intention of business education graduating students in Rivers State (y)	3.61	2.66	2.4	0.7		No significant relationship	Accepted

Source: Field Survey, 2024

The analysis in the Table 3 proves that the value of the r-calculated is 0.7 while t-crit is 1.968 indicating no significant relationship between social environmental factor and entrepreneurial intentions of business education graduating students in Rivers State Universities.

Table 4: **t- test of relationship between individual/psychological factor and entrepreneurial intentions of business education graduating students in Rivers State.** **N 875**

Variable	∑X	∑Y	∑X²	∑Y²	∑XY	t-trans	t-crit	df	Level of Significant	Decision
Individual psychological factor (x)	4.34		3.86			4.48	1.962			
Entrepreneurial intentions of business education graduating students in Rivers State (y)		3.61		3.62	3.18			873	0.05	Accepted

Source: Field Survey, 2024

The analysis in Table 4 shows that the t-transformation is higher than the t-critical 1.968 which indicate acceptance of the hypothesis with a degree of freedom of 873 at a significant level of 0.05, therefore alternate hypothesis is stated, which implies a significant difference between individual/psychological factor and entrepreneurial intentions of business education graduating students in Rivers State Universities.

Table 5: **t-test of the relationship between family background factor and entrepreneurial intentions of business education graduating students in Rivers State.** **N 875**

Variable	∑X	∑Y	∑X²	∑Y²	∑XY	t-trans	t-crit	df	Level of Significant	Decision
Family background factor (x)	3.33		2.14							
Entrepreneurial intention of business education graduating students in Rivers State (y)		3.61		2.66	2.38	-5.1	1.962	873	0.05	Rejected

Source: Field Survey, 2024

The analysis in Table 5 shows that the t-transformation is lower than the t-critical, which is indicating rejection of the hypothesis with a degree of freedom of 873 at a significant level of 0.05 therefore the hypothesis remains no significant difference between family background factor and the entrepreneurial intention of business education graduating students in Rivers State Universities.

Table 6: **t-test of the relationship between social environmental factor and entrepreneurial intention of business education graduating students in Rivers State .** **N 875**

Variable	∑X	∑Y	∑X²	∑Y²	∑XY	t-trans	t-crit	df	Level of Significant	Decision
Social environmental factor(x)	3.51		3.07							
Entrepreneurial intention of business education graduating students in Rivers State (y)		3.61		2.66	2.4	-40.7	1.962	873	0.05	Rejected

Source: Field Survey, 2024

The analysis in Table 6 shows that the t-transformation is lower than the t-critical, which indicates rejection of the hypothesis with a degree of freedom of 873 at a significant level of 0.05. Therefore, the hypotheses remain no significant difference between social background factor and entrepreneurial intentions of business education graduating students in Rivers State Universities.

Discussion of Findings

From the result, Research Question I reveals that individual/psychological factor, correlates with entrepreneurial intentions of business education graduating students of Rivers State to a weak relationship mean responds. This is in agreement with the study of Zhengxia Genshui and Hui (2012) who observed a strong acceptance from the decision to start a business after graduation, but showing no strong entrepreneurial intentions, no willingness to start a business, no good and do not see business opportunities hence no motivation. The test of hypotheses on the table shows that there is significant relationship between individual/psychological factor and entrepreneurial intention of business education graduating students in Rivers State is rejected. Hence alternate hypothesis was stated.

The result of the Research Question 2 indicates that family background factor correlates with entrepreneurial intentions of business education graduating students of Rivers State, to a non-significant relationship response. This is in line with the result, of Thou, Abo and Toma (2016) who supported the view as stated in the hypothesis as rejected, that the students of Rivers State Universities lack support or motivation from family and discouragement from people.

Research Question 3 revealed that social environmental factor are correlates of entrepreneurial intentions of business education graduating students in Rivers State to a no significant relationship mean response. This agrees with Aummer in Zhenpxia Gersshua and Hai (2012) that social environmental factors like legal rule, government support are a social aspect of entrepreneurial intention of Business Education graduating students in Rivers State.

Conclusion

Entrepreneurial intention is a psychological state that guides individual attentions towards specific business goal, in order to achieve entrepreneurial results. It is the recognition that individuals take action to develop new business or create new values in existing enterprise activities and promote economic and social development. This study revealed that individuals' psychological factor, family background, social environmental factors are correlates of entrepreneurial Intentions and that a relationship exists between these factors and entrepreneurial intentions of business education graduating students in Rivers State.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Students should be should be focused and self-motivated as this will help them in acquiring and improving there skills as to take up entrepreneurial endeavors.
2. There should be family support for graduating students as motivational tool for the student in activating entrepreneurial intentions.
3. Government and other stakeholders should support the graduating students with starter packs as motivational tool to building entrepreneurial intentions.

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Entrepreneurship and the Future of Business Education Students in Rivers State

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Abstract

Entrepreneurship as a factor of production entails creating values upon recognizing a business opportunity. It is pertinent for development in the society and as such entrepreneurship education is given keen attention in order to produce entrepreneurs. Business Education as a field of study has its roots in entrepreneurship as the programme is geared towards development of skills. The advancement in technology provides an avenue to venture into business regardless of finance for physical work place however, without requisite entrepreneurial knowledge, opportunities may not be capitalized on. Business Education thus provides Business Education students with requisite knowledge for entrepreneurship. It is expected therefore of Business Education students to collaborate with existing companies or businesses to carry out business activities, capitalize on technology such as artificial intelligence and explore market trends. Suggestions put forward included that Business Education students ought to collaborate with existing companies or businesses to carry out business activities, they ought to capitalize on artificial intelligence to render services of which they will be paid for and Business Education students ought to explore entrepreneurial activities such as social Entrepreneurship and Techno-preneurship.

Keywords*: *Entrepreneurship, Business Education, Techno-preneurship, Future

Introduction

Entrepreneurship is one of the four factors of production. The other three are land, labour and capital. The entrepreneur is the one that brings the other three factors- land, labour, capital together in other words; it is the entrepreneur that coordinates production activities. The entrepreneur is someone who is quick to realize that an opportunity exists, seizes the opportunity and looks for the necessary ingredients (land, labour, capital) to actualize the opportunity (Ibrahim, 2022). Entrepreneurship is about creating value as a result of recognition of a business opportunity, effectively managing the risk involves, coordinating the various activities and necessary resources and ultimately reaping the envisaged returns. Entrepreneurship is thus the process of creating value by devoting the necessary time and effort, assuming the accompanying financial, psychological and social risks and eventually receiving the envisaged returns.

Entrepreneurship is really all about identifying, developing and bringing a vision, an idea, and an opportunity to reality. The ultimate objective is to eventually get a return for venturing into the unknown. Entrepreneurship is all about tenacity. The entrepreneur believes that the environment and what it offers can be influenced and successfully managed and value created for the benefit of the economies and citizens of nations (Ibrahim, 2017). Business Education and entrepreneurship are skill-based courses. Skills are mostly psychomotor in nature, involving some forms of activities. Activities in Business Education and entrepreneurship involves skill acquisition, example includes keyboarding word processing, data processing, accounting, marketing, salesmanship, office technology etc.

The importance of entrepreneurship cannot be overemphasized as it not only facilitates reduction in unemployment but also aide's economic development as there is creation of value through entrepreneurship which positively affects the society (Jones, Ratten & Hayduk, 2020). Entrepreneurship enables individuals to recognize opportunities, capitalize on it and make profit while solving a problem. It is no gain saying that without entrepreneurship, no economy can develop. In this regard, Ratten (2023) views entrepreneurship as the process of identifying business opportunities, utilizing new or existing recombination of resources innovatively and creatively. This is because through entrepreneurship, there is creation of jobs which leads to upgrade in the standard of living of individuals as people will be employed which in turn drives economic competitiveness and reduces poverty in local areas.

In a bid to enhance entrepreneurial activities for economic development, Entrepreneurship Education has been inculcated into academic curriculum. However, academic programme such as Business Education has its roots in Entrepreneurship Education as Business Education programme comprised diverse subject areas including entrepreneurship as well as marketing. Business Education degrees created in the U.S in the 1880's were geared towards formalizing the education of future business leaders. This buttresses the entrepreneurial nature of Business Education (Koko, 2019). According to Idialu in Amesi (2019), Business Education is an aspect of Vocational Education that is concerned with development of productive teachers, individuals with skills for employment as well as self-employment. In Rivers State, Business Education is a well-established programme of learning as the state houses tertiary institutions that offers Business Education.

With this change in the society, it expected that technological changes be reflected in entrepreneurial activities and as it concerns Business Education students who are being prepared for the world of business, their thoughts and level of thinking ought to reflect technological changes. In this regard, Kamsker (2021) opined that being digital is a requirement for work and participation in the society. This is to say that to be entrepreneurially relevant, necessity is laid on considering technology for entrepreneurial activities. Business Education students are therefore placed with a responsibility of adopting technology for entrepreneurial activity in the society to meet up with recent trends in entrepreneurship. This study therefore considers entrepreneurship and the future of Business Education Students in Rivers state.

Entrepreneurship and Importance of Entrepreneurship

In considering the concept of entrepreneurship, it is pertinent to talk about the personality of an entrepreneur. An entrepreneur is someone carrying out an independent activity (Amesi, 2014). From the description of who an entrepreneur is, it can be deduced that entrepreneurship entails developing ideas to meet up the needs of the society. Amesi in Amesi and Peterside (2019) opined entrepreneurship as creating something from the scratch, utilizing available capital in an open market for profit making. Entrepreneurship is a way out of dependency. In line with this, Dambo and Ben-George (2022) regarded entrepreneurship as a life support as people are venturing into entrepreneurship in order to make ends meet and for the improvement of economic activities at large. It is capitalizing on opportunities identified in an environment. Similarly, Koko and Chike (2020) mentioned that entrepreneurship is vital for development and growth of every economy.

Entrepreneurship is important to individuals, community and economy at large. For individuals it provides an avenue for reduction of idleness and unemployment which may lead to people engaging in crime. It is in this regard that Ubulom and BudukaChike (2022) noted that entrepreneurship develops skills in students such as logical reasoning, resilience mindset, determination and positive mindsets helps in reducing youth restiveness in the society. There is a popular saying that "an idle mind is the devil's workshop". When youths are not engaged there is a possibility of engaging in crime and entrepreneurship presents an avenue to engage both the thoughts and actions of individuals thus reducing the rate of unemployment in the society.

Unemployment is one plague that has eaten deep in the society. For reduction in unemployment, government created jobs cannot successfully reduce the rate of unemployment thus the importance of entrepreneurship as jobs are created through entrepreneurship.

Entrepreneurship brings about creation of small and medium scale enterprises which employs people in the society. Ajuwon, Ikhide and Akotey (2017) reported that the level of employment by MSMEs in Nigeria is high compared to larger firms. This buttresses the importance of entrepreneurship to individuals as employment is made possible. Not to forget to mention that government employments are not regular and corruption has eaten deep into government agencies hence employment for a common man without connection may seem impossible. Most employment in public sectors are based on relationship and referrals from friends and relatives. This negatively affects employment as there would still be more unemployed persons owing to the fact that they lack connections (Sabir, 2022). With entrepreneurship, there is reduction in the rate of unemployment as different organizations small, medium and large would require the services of different individuals leading to employment.

Entrepreneurship also brings about personal development for individuals. The process of commencing and running a business entails leaving ones comfort zone and taking up challenges. This makes people develop skills such as problem-solving, decision-making and adaptability. Seeing unexpected situations and thinking of possible solution to the problem develops individuals. Also, self-confidence and self-belief is developed. Running a business requires self-belief regardless of obstacles that may be encountered. The fact that there would always be needs and wants from people implies that entrepreneurs have to brain storm on meeting these ever pressing needs which connotes self-development. Self-development is vital for entrepreneurial success and as such necessity is always laid on entrepreneurs to develop (Garn, 2023).

As it concerns economic development, entrepreneurship plays a vital role. For economic development, there ought to be improvement in various sectors. Needless to repeat job creation as entrepreneurs create new businesses and employ people. Innovation and technological advancement is enhanced through entrepreneurship. Entrepreneurs develop new products and services that lead to an increase in productivity, efficiency and competitiveness bringing about economic growth. Entrepreneurship helps in raising living standards of people, elimination of poverty in rural areas, community development, and provision of economic independence as well as encouragement of capital investment. It further increases per capita income, optimal use of resources and new entrants which brings market innovation (Nexford University, 2023). This is to say that any country with an increased and developed economy has it backing from entrepreneurship.

Challenges of Entrepreneurship

Despite the importance of entrepreneurship, it is not without challenges. One of the challenges of entrepreneurship is development of business ideas. An entrepreneur ought to see what other people ignore or are not seeing. It becomes a problem when an individual has the zeal and even the capital to commence a business but lacks the ability to identify a need or come up with ideas to develop an existing product or services. An entrepreneur should have the ability to envision ideas. Solutions rather than problem should be seen by an entrepreneur (Lohitkumar & Sivaprasad, 2016). Vision goes with developing a business idea. Most new entrepreneurs go into business without vision and this is a major challenge for entrepreneurs

Another challenge of entrepreneurship is financing. Finance is very important as it facilitates the activities of a business. However, raising capital for entrepreneurs is not easy especially for a new business. Experienced entrepreneurs do not find it very easy when it comes to funding a business how much more inexperienced and new entrepreneurs.

Government Policies: it is no news that government policies play important roles in the economy of a nation. Entrepreneurship is the bedrock of a country’s economy and it is noticed that government that has favourable policies stand better chances of improved economy and industrialization. This goes further to prove that a government policy affects entrepreneurship either negatively or positively (Akinyemi & Adejumo, 2018).

Oliyide (2012) mentioned that programmes such as small and medium enterprises development agency (SMEDAN), N-Power, Government Enterprise and Empowerment Programme (GEEP) and You-win programme are geared towards promoting entrepreneurial activities in Nigeria. These programmes helps entrepreneurs to access funds and other resources to effectively carryout their business activities. This shows that policies can hinder or prosper entrepreneurial activity in an environment.

Business Education and Entrepreneurship

Entrepreneurship is not a new concept to Business Education. As a matter of fact entrepreneurship is a core aspect of Business Education. Business Education was originally designed to offer students' the opportunity to develop the desire, abilities, skills and understanding of the vocational opportunities available in the world of works (Akpomi, & Kayii, 2020). Ubulom and Dambo (2016) posited Business Education as an educational training directed towards equipping individuals with business and vocational skills. Ubulom and Dambo (2016) further buttressed that Business Education is concerned with equipping students' with various approaches for teaching and acquisition of abilities needed in industries as well as skills necessary to be self-employed and employers of labour. This reveals the entrepreneurial nature of the programme Business Education. To further strengthen entrepreneurship and in line with inculcation of Entrepreneurship Education into academic curriculum, Business Education considers Entrepreneurship Education important.

Entrepreneurship Education curriculum includes contents to enable students identify and capitalize on opportunities, access business concepts, come up with plans to launch new enterprises or develop existing ones (Moses & Mosunmola, 2014). The objectives of Entrepreneurship Education as listed by Vedantu (2023) include:

i. Development of entrepreneurial qualities among people through training and expert guidance.
ii. Identification of business opportunities and developing business ideas as regards the identified opportunity or develop existing businesses.
iii. Motivating and directing individuals to launch their own businesses and startups hence contributing to the development of the economy.
iv. To help individuals and youths plan ahead to reduce threats. (risk mitigation)
v. Provision of programmes to develop entrepreneurship in rural areas
vi. Generation of employment through small and medium enterprises development.

Similarly, Pac and Abdulkarim (2016) mentioned the objectives of entrepreneurship to be development of right mindset for business startup and identification of job opportunities, empowerment of youths to successfully create a business a business venture, and attract attention on productivity gains and environmental practices. Through entrepreneurship education, a good number of graduates who are well equipped with skills and knowledge of managing small and medium enterprises will be produced. This will consequently, help in job creation and reduction in poverty rate (Muogbo & John-Akamelu, 2018).

From the objectives of Business Education and Entrepreneurship Education, it is seen that Business Education is knitted with entrepreneurship. In conformity, Dauda and Akaeze (2014) opined Business Education as a machinery for promoting and encouraging entrepreneurship as it equips students with prerequisite skills to go into business. For reduction of unemployment and subsequent development of the economy, Business Education is vital. Dauda and Akaeze(2014) further noted that Business Education as a facilitator for entrepreneurship, develop skills for financial management. Without proper financial management skills someone might venture into business and make losses rather than profit but business education equips student with adequate financial management skills. Marketing is another important aspect of business. The ability to attract target market and make sale is a skill every entrepreneurs should develop and business education make that possible.

Entrepreneurship and Business Education Future

Entrepreneurship has brought to consciousness the importance and impact of Business Education. According to Koko (2019), there are misconceptions about Business Education programme as it is asserted to be a study for persons who are not intellectually inclined. This assertion may not be far from the mindset that skill acquisition is predominantly for people with poor educational background or those who cannot afford to get formal education. With the awareness of entrepreneurship for development in the society and economic relevance, the future of Business Education is placed at an enviable position. This is because Business Education prepares students who would be of importance in the society as they are trained to create wealth from nothing to something (Amesi & Peterside). This also validates the view of Khan (2015) who noted that Business Education is much market oriented thus making it face criticism from other disciplines. When a product is good and meets requirements from consumers, it makes sales easily; this is also applicable to Business Education seeing that it is a marketable programme.

Considering the evolving nature of entrepreneurship; the future of Business Education lies in fostering creativity, resilience and real world problem solving skills. This connotes embracing digital platforms for learning and being abreast on recent trends. In conformity, Albaqami (2016) posited that Business Education ought to be taught in an innovative way due to the current environment and change. An indication that the future of Business Education is hinged on adapting to changes in the society to meet up ever changing needs of the society. It is necessary to state that collaboration is important for the future of Business Education, thus, collaborative approach ought to be adopted for instructional delivery. This is facilitating brain storming activities among Business Education students (Dambo & Pyagbara, 2022).

Entrepreneurship and the Future of Business Education Students in Rivers State

No doubt the interconnectedness between entrepreneurship and Business Education however, entrepreneurship has taken a different shape. The evolvement of entrepreneurship with focus on technical literacy and practical skills necessitates Business Education students to advance in order to accommodate technology. Trends in entrepreneurship include technoporeneurship. As technology increases and with the ever changing demands of consumers, entrepreneurship has blended into these changes (Eker, 2023). Techno-preneurship seems to be the new entrepreneurship. Techno-preneurship is a combination of technology and entrepreneurship. It entails identification of business opportunities by leveraging technology and innovation. It comprises of big, small and medium enterprises ICT and multimedia companies (Idris & Elijah, 2017).

Technology have brought about ease in carrying out activities and the internet as an aspect of technology offers opportunities for creation of innovative technology based businesses (Phuthong, 2023). Techno-preneurs are seen at the hem of business affairs and the impact notable in the economy. We have the likes of Steve Jobs, Bill Gates, Elon Musk, Mark Zukerberg, Jeff Bezos, Marian Kameel, Melissa Jun, Margarita Aroro among others (Rosen, 2022). From the foregoing, it can be deduced that entrepreneurship is now centered on technology which implies that Business Education students ought to have a paradigm shift towards creative innovation, adoption and adaptation of technology for business activities. They ought to capitalize on the following:

Experiential and practical learning: experiential learning is a teaching method that facilitates active learning by making provision for real-word experiences in which learners interact and evaluate course material thus becoming involved with the topic taught (Boggu & Sundarsingh, 2019). Business Education focus ought to be more on practical and experiential learning. Obi, Eze and Chibuzo (2021) opined the need for production of business education graduates with 21st century competencies, it becomes imperative to adopt experiential learning. This is because students would to be equipped with practical skills to venture into the world of business. Experience as is generally said, “is the best teacher” and experiential learning is practical.

Innovative and creative: Innovation and creativity here connotes application of digital technology for business activities. Being creative and innovative will enable Business Education students create jobs through digital platforms and applying technology rather than seeking employment. Entrepreneurship is centered on creativity and innovation and as such, business education should place great emphasis on creativity and innovation, in line with this, Tang (2017) referred to creativity and innovation as driving force of entrepreneurship which leads to globalization.

Globalize: It is necessary for Business Education students to incorporate global perspective into entrepreneurship. Practical approaches like studying international market ought to be given cognizance among Business Education students. This is to enable students relate globally with other practices and relate to their environment. In Rivers State, Business Education students are expected to capitalize on platforms such as social networking sites to get business solutions and apply to their environment which in some cased may lead to technology integration.

Technology Integration: It is expedient that Business Education students integrate technologies like Artificial intelligence, block chain and data analytics for business ventures. The entrepreneurial sphere is characterized by digital innovations of which artificial intelligence and block chain have gained recognition. Artificial intelligence offers opportunities for new businesses and growth. Artificial intelligence has revolutionized business operations and increase competition (Denning, 2023). From the foregoing and considering the nexus between entrepreneurship and Business Education, it would not be wrong to state that Business Education students are advantaged in the society. This is because the training received through Business Education and by extension Entrepreneurship Education, presents them with skills for surviving even in an environment with high rate of unemployment. As a matter of fact, Business Education students are trained to be employers of labour. With technological advancement and incorporation of technology for entrepreneurial activities, Business Education students would capitalize on the technological sphere which does not necessary requires physical business structure before carrying out business ventures. This presents a bright future for Business Education students.

Way forward

1. Collaboration: Business Education students ought to collaborate with existing companies or businesses to carry out business activities. Collaboration is made easy as they can utilize social networking sites made available through technology to exchange ideas with companies in and outside their geographical location. They ought to leverage on technology and share their ideas globally.
2. Capitalizing on artificial intelligence: artificial intelligence is dominating the technological sphere and by extension the business world. Business Education students ought to capitalize on artificial intelligence to render services to people of which they would be paid for. They can develop skills using artificial intelligence which can be used to generate income subsequently.
3. Explore market trends: Business Education students ought to explore entrepreneurial activities such as social entrepreneurship and technopreneurship. There is a growing trend towards social entrepreneurship. Businesses are created to positively impact social or environment while making profits. This entails social responsibility sustainability and ethical business practices.

Conclusion

Entrepreneurship and Business Education are interwoven, in the fact that Business Education is education for and about business and entrepreneurship entails setting up a business. In recent years, entrepreneurship has evolved in line with digital technologies. The business world is characterized by digital innovations as technology is integrated in rendering services and delivery of goods. Business Education students are expected to leverage on digital technologies for entrepreneurial activities. There is provision of business space digitally regardless of physical business space as businesses have gone digital. For Business Education students in Rivers State, it is expected of them to identify problems and proffer solutions, integrating technologies such as artificial intelligence among others.

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Digital Entrepreneurial Marketing Skills as Panacea for Unemployment among Business Education Graduate Students in Rivers State Universities

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Abstract

The study investigated Digital Entrepreneurial Marketing Skills as Panacea for Unemployment among Business Education Students in Rivers State Universities. This study adopted a correlational research design The population of this study is 125 Business Education graduate students of 2022/2023 academic session, 57 from Rivers State University and 68 from Ignatius Ajuru University of Education. The total population was used for the study since it is of a manageable size and as such the census sampling technique was adopted. The instrument for data collection was questionnaire structured on a four-point rating scale. The instrument was validated by three experts. In order to establish the reliability of the instrument the test re-test method was adopted; scores obtained were correlated using Pearson Product Moment Correlation Coefficient and it yielded a reliability coefficient index of 0.82 and 0.79 respectively. Pearson Product Moment Correlation Coefficient (r) was used to answer the research questions and t-transformation was used to test the hypotheses and to establish the relationship between the two variables at 0.05 levels of significance and decision was made based on the r-value. The study revealed a positive low relationship between social media marketing and unemployment reduction among Business Education graduates in rivers state universities. It was recommended that Students should utilize their social networking handles for marketing purpose as it has proven to be very beneficial in marketing product in the digital era.

Keywords: *Digital, Entrepreneurial, Marketing, Skills and Unemployment*

Introduction

Unemployment situation in the country has assumed a critical stage as it has brought about untold hardships on the lives and wellbeing of Nigerians. This scenario has assumed a disturbing dimension posing great concern to graduates and the entire Nigerian populace. Anum, Makanjuola and Shaibu (2021) stated that the National Bureau of Statistics (NBS) in March, 2021 revealed that Nigeria's unemployment rate rose from 27.1 percent in the second quarter of 2020 to 33.3 percent in the fourth quarter of 2020. This revelation is worrisome as the rate of unemployment keeps rising geometrically with its attendant consequences culminating in poverty, crime, abuse among others. The present situation of Nigeria's economy has seriously affected organizational workforce which has resulted to unemployment amongst graduates.

Unemployment is the situation in which people that are able and willing to work cannot find any job to be engaged in. Individuals who are unemployed are often more susceptible to several challenges including difficulty in finding future employment and decrease in income (Anum& Shaibu 2021). In an attempt to tackle this problem of unemployment the federal governments introduce entrepreneurship in higher institutions in other to equip students with the requisite skills to be self-reliant.

Entrepreneurship plays a vital role in economic development through creation of utilities and generation of employment within a short period (Amesi &Akpomi, 2014).Amesi (2021) stated that entrepreneurship is the ability to set up a business enterprise as different from being employed. This ability according to them ought to be acquired and to enable a person obtain an employment. Entrepreneurship involves the acquisition of skills, ideas and abilities necessary for self-reliance. Amesi (2021) viewed entrepreneurship as the ability to create and build something from practically nothing through digital marketing.

Marketing skills are requisite skills that involve thinking about how to reach the targeted audience for product and service produce by an entrepreneur, Oyerinde and Kalen, (2016).

They further opined that any entrepreneurs who acquire these marketing skills will be able to cross the bar of unemployment as these skills will enable him or her sell product at profits, that is to say that marketing is a key factor in entrepreneurial skills development because it determines the success or failure of a business in the same direction. Ademiluiyi, (2017) opined that the development of marketing skills offer the entrepreneurs the unique strategy of success in business, he further identified area of marketing skills to include; salesmanship and negotiation, sale records keeping, pricing, advertising channels, advertising media, consumer behaviour appreciation and transportation.

Marketing is one of the major areas of Business Education, which provides for the acquisition of entrepreneurial skills and has as one of its mandate to graduate students who will become self-reliant. Business Education is designed to meet the need of persons who have interest or are preparing to become entrepreneur. In the view of Akpomi and Kayii(2020) Business Education is a programme originally designed to offer students the opportunity to develop the desire abilities, skills, and understanding of the vocational opportunities available in the world of work. Amesi and Nkoro (2020) sees Business Education as an important part of general education which emphasize on skills and competencies acquisition for use in office and business related occupation.Dambo and Pyagbara (2021) buttressed that, Business Education is a collaborative programme in which industrial sectors of any economy form partnership thereby preparing the individual to adequately fit into both industry and classroom as a professional.

For any country to foster genuine economic growth and development, its educational system must be considered as the bedrock of any meaningful development for economy to be balanced or be at the average level, it must make sure that the entrepreneurship education is functional and the various facilities needed for proper skills acquisition must be at the disposal of the ready mind in other to properly achieve the aim of the programme and making sure that efficiency and competency is actualized (Ohaka, Nnokam &Akpomi, 2018).Entrepreneurship equips individuals with better marketing skills to function effectively and be self-reliant. Today, marketing activities has changed with the help of digital technologies.The use of these technologies to carryout marketing activities is known as digital marketing. It involves the use of digital channels to market product and services in other to reach the final consumers. The term digital marketing refers to the use of websites, app, mobile devices, social media and other digital means to promote and sell products and services (Adam, 2023). It is worthy to note that the emphasis of this study was placed on social media marketing, content marketing and data analysis as Digital entrepreneurial marketing skills.

The term content marketing refers to a method of marketing that includes creating and sharing online content that doesn't just promote a brand, but rather is designed to encourage its audience to visit a brand websites. Content marketing is a marketing strategy used to attract, engage, and retain an audience by creating and sharing relevant articles, videos podcasts and other media. Content marketing is the development and distribution of relevant useful content blogs, newsletters, white papers, social media posts, emails and videos (Marketing Library, 2023). Adobe (2023) stated that content marketing is a strategy and business process that uses valuables and relevant digitals assets like texts, images and videos to attract and retain a clearly defined audience. It's a type of inbound marketing strategy that delivers values to a business audience through entertaining, educational or informative content. Content marketing is a technique of creating and distributing valuable, relevant and consistent content to attract and acquire a clearly defined audience (Roi, 2023).

Content marketing comes in four basic forms; written, audio, videos, and image. Most businesses use several forms of content to engage with their audiences across platforms like social media websites and ads (Adobe, 2023). Content marketing is a marketing strategy that puts the customer at the heart of a brands messaging. Rather than spamming customers with advertising-laden messaging, it provides them with valuable content and engages them throughout the customer journey. In the view of Liu and Huang (2015) content marketing is considered as pull marketing strategy rather than pushing where it creates content that can add more value to what a consumer is searching for.

Omar and Bryan (2021) stated that content marketing deals with an invitation from businesses or marketers to undertake consumer at the right time during their buying process, it includes generating, allocating, sharing, and approach content to create an urge for consumer to purchase a products or services.

Social media marketing is a form of digital marketing that leverages the power of popular social media networks to achieve your marketing and branding goals. Adam (2023) stated that Social media marketing is the use of social media the platforms on which users build social networks and share information to build a company's brand, increase sales, and drive website traffic. As platforms like WhatApp, TikTok, Facebook, and Instagram took off, social media transformed not only the way we connect with one another but also the way businesses are able to influence consumer behavior from promoting content that drives engagement to the extracting of geographic, demographic, and personal information that makes messaging resonate with users. In the view of Ukata and Cliford (2022), Social media marketing (SMM) are forms of internet marketing skills that use social media apps as marketing tools for products and services. Social media platforms enable brands to connect with their audience to build a brand, increase sales, drive traffic to a website, and build a community of followers to share and engage with the business contents. These are done through the five pillars of social media marketing vis-a-vis social strategy in determining the goals, selecting social media platforms and contents mix. The next is planning and publishing the contents, listening and engaging customers, be analytic and reporting to management for decision making, and finally do advertising (La-fleur, 2022).

Data analysis is the process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, informing conclusions and supporting decision-making. Coursera (2023) stated that data analysis is the practice of working with data to glean useful information, which can be used to make informed decision. That is, data are made available to organization as they continue to grow both in amount and complexity. Data analysis deals with the process of cleaning, analyzing, interpreting, and visualizing data using various techniques and business intelligence tools. Shea (2023) stated that data analysis tools help you discover relevant insights that lead to smarter and more effective decision making. That is, it is a way of examining, filtering, adapting and modeling data to help solve problems. Organizations use data analyzed to determine what is and what is not working, so as to aid them to make the necessary changes needed to achieve your business goals.

When data are gathered they are converted into knowledge that will aid decision-making process. Data driven decisions are decisions that made based on the available data, which has been analyzed and interpreted. Organizations rely on relevant, reliable, accurate and timely data to elevate their performance. To leverage on the benefits of data analysis, social media marketing and content creation Business Educations graduates need to invest in various aspect of digital entrepreneurial skills to curb the challenges of unemployment (Ojo-Agbodu, Idowu& Adebayo 2022).Digital entrepreneurial marketing if leverage upon by Business Education students will serve as a remedy to the issue of unemployment. It is against this background that the study sought to examine Digital Entrepreneurial Marketing as Panacea for Unemployment among Business Education Graduate Students in Rivers State Universities.

Statement of Problem

Today, without exaggerating information and communication technology has become a model of innovation and competitiveness all round the world. Information communication technology has introduced a new form of entrepreneurship known as digital entrepreneurship. This entrepreneurship is gradually replacing the traditional entrepreneurial activities as there is a continuous innovation of technology and entrepreneurs are leveraging in technology. So many graduates are adopting digital practices for entrepreneurial purposes as a means of self-employment and as such there is need for digital entrepreneurial marketing. Digital entrepreneurial marketing provides graduates with opportunities to develop important skills, create job opportunities and innovate in a rapidly changing global society. Digital marketing offers many opportunities for the graduates to become self-employed.

Regardless of the benefits of digital marketing, it appears that some graduates of Business Education seems not to take full advantage of digital entrepreneurship skills to become self-reliant as the number of unemployed graduates including Business Education graduates continues to increase in the society. To affirm this, Ukata and Edwin (2021) stated that there is high unemployment and poverty rate among Business Education graduates as they barely utilize their digital skills upon graduation for business purposes thus becoming self-employed. Considering the technological era and the ever increasing business opportunities that is made available due to digital technologies, the researcher wonders if Business Education graduates utilize digital entrepreneurial marketing skills for business activities in order to reduce unemployment? This study therefore was carried out to determine the relationship between digital entrepreneurial marketing and unemployment reduction among Business Education students in Rivers state universities.

Purpose of the Study

The aim of the study is to investigate Digital Entrepreneurial Marketing as Panacea for Unemployment among Business Education Graduate Students in Rivers State Universities. Specifically, the study sought to:

1. Determine the relationship between content creation and unemployment reduction among Business Education graduate students in Rivers State Universities.
2. Determine the relationship between social media marketing and unemployment reduction among Business Education graduate students in Rivers State Universities.
3. Determine the relationship between data analysis and unemployment reduction among Business Education graduate students in Rivers State Universities.

Research Questions

The following research questions were posed to guide the study;

1. What is the relationship between content creation and unemployment reduction among Business Education graduate students in Rivers State Universities?
2. What is the relationship between social media marketing and unemployment reduction among Business Education graduate students in Rivers State Universities?
3. What is the relationship between data analysis and unemployment reduction among Business Education graduate students in Rivers State Universities?

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance

1. There is no significant relationship between content creation and unemployment reduction among Business Education graduate students in Rivers State Universities.
2. There is no significant relationship between social media marketing and unemployment reduction among Business Education graduate students in Rivers State Universities.
3. There is no significant relationship between Data analysis and unemployment reduction among Business Education graduate students in Rivers State Universities.

Methodology

This study adopted a correlational research design and the area of the study was Universities in Rivers State. The population of this study consists of 125 Business Education graduate students of 2022/2023 academic session; 57 from Rivers State University and 68 from Ignatius Ajuru University of Education. The total population was used for the study since it is manageable and as such the census sampling technique was adopted. The instrument used for this study was two self-structured questionnaire developed by the researcher. There was no sample due to the small population of the study. The first was to determine the digital entrepreneurial marketing skills and the second questionnaire was to ascertain it as panacea for unemployment among Business Education graduate students in Rivers state universities.

The questionnaire was structured on a four-point rating scale of Very High Extent (VHE -4 points), High Extent (HE -3 points), Moderate Extent (ME -2 points), and Low Extent (LE -1 point). The first instrument was tagged "Digital Entrepreneurial Marketing Skills Questionnaire" and the second tagged "Digital Entrepreneurship Marketing for Unemployment Reduction Questionnaire". The instrument was validated by three experts; Two from Business Education and one from Measurement and Evaluation. Corrections and inputs made by the experts were taken into consideration by the researcher before the final copy of the instrument was produced for administration to the respondents. In order to establish the reliability of the instrument that was used for the study, test re-test method was adopted, scores obtained were correlated using Pearson Product Moment Correlation Coefficient and it yielded a reliability coefficient of 0.82 and 0.79 respectively. Pearson Product Moment Correlation Coefficient (r) was used to answer the research questions and t-transformation was used to test the hypotheses and to establish the relationship between the two variables at 0.05 levels of significance and decision was made based on the r-value.

Results

Research Question 1

What is the relationship between content creation and unemployment reduction among Business Education graduate students in Rivers State Universities?

Table 1: Respondent Rating of Pearson Product Moment Correlation Coefficient on the relationship between content creation and unemployment reduction among Business Education graduate students in Rivers State Universities

Variables	N	∑X	∑Y	X^2	Y^2	∑XY	r	Remark
Content creation	105	292.4		817.44		778.96	-0.38	Negative low
Unemployment reduction	105		281.16		787.65			

Source: Field Survey Data (2024)

The analysis in Table 1 showed that (r = -0.38) indicating that a negative low relationship exist between content creation and unemployment reduction. This connotes that an increase in content creation tends to decrease unemployment among Business Education graduates in Rivers state universities. However, the relationship is not strong.

Research Question 2

What is the relationship between social media marketing and unemployment reduction among Business Education graduate students in Rivers State Universities?

Table 2: Respondent Rating of Pearson Product Moment Correlation Coefficient on the relationship between social media marketing and unemployment reduction among Business Education graduate students in Rivers state universities

Variables	N	∑X	∑Y	X^2	Y^2	∑XY	r	Remark
Social media marketing	105	269.6		723.96		723.67	0.05	Positive low
Unemployment reduction	105		281.16		787.65			

Source: Field Survey Data (2024)

The analysis in Table 2 showed that (r = 0.05) indicating that a positive low relationship exist between social media marketing and unemployment reduction among Business Education graduates in rivers state universities. This connotes that there is a slight decrease in unemployment among Business education graduate students with the increase in social media marketing. This also does not show a strong relationship.

Research Question 3

What is the relationship between data analysis and unemployment reduction among Business Education graduate students in Rivers State Universities?

Table 3: Respondent Rating of Pearson Product Moment Correlation Coefficient on the relationship between data analysis and unemployment reduction among Business Education graduate students in Rivers state universities

Variables	N	∑X	∑Y	X^2	Y^2	∑XY	r	Remark
Data analysis(X)	105	284.25		792.06		758.9	-0.08	Negative low
Unemployment reduction(Y)	105		281.16		787.65			

Source: Field Survey Data (2024)

The analysis in Table 3 showed that (r = -0.08) indicating that a negative low relationship exist between data analysis and unemployment reduction among Business Education graduates in Rivers State Universities. This implies a strong negative correlation and that an increase in the effectiveness of data analysis is associated with a significant decrease in unemployment among Business education graduates in rivers state universities.

Hypothesis 1

There is no significant relationship between content creation and unemployment reduction among Business Education graduate students in Rivers State Universities.

Table 4: t-transformation Result for Test of the Significance between content creation and unemployment reduction among Business education graduate students in rivers state universities.

Variable	N	∑X	∑Y	X^2	Y^2	∑XY	R	Df	t-cal	t-crit	∝	Remark
Content creation	**105**	**292.4**		**817.44**		**778.96**	**-0.38**	**103**	**-4.17**	**2.00**	**0.05**	**Retained**
Unemployment reduction	**105**		**281.16**		**787.65**							

Source: Field Survey Data (2024)

The analysis in Table 4 revealed that the t-calculated is lesser than t-critical (t-cal<t-crit). Hence the hypothesis was retained. Therefore, there is no significant relationship between content creation and unemployment reduction among Business Education graduate students in Rivers state universities.

Hypothesis 2

There is no significant relationship between social media marketing and unemployment reduction among Business Education graduate students in Rivers State Universities.

Table 5: t-test of Difference in the mean rating of Business Education Graduate Students in Rivers State University and Ignatius Ajuru University of Education on the extent to which Social Media Marketing is a Panacea for Unemployment

Variable	N	∑X	∑Y	X^2	Y^2	∑XY	r	Df	t-cal	t-crit	∝	Remark
Social media marketing	105	269.6		723.96		723.67	0.05	103	0.51	2.00	0.05	Retained
Unemployment reduction	105		281.16		787.65							

Source: Field Survey Data (2023)

The analysis in Table 5 revealed that the t-calculated is lesser than t-critical (t-cal<t-crit). Hence the hypothesis was retained. Therefore, there is no significant relationship between social media marketing and unemployment reduction among Business Education graduate students in Rivers state universities.

Hypothesis 3

There is no significant relationship between Data analysis and unemployment reduction among Business Education graduate students in Rivers State Universities.

Table 6: t-test of Difference in the mean rating of Business Education Graduate Students in Rivers State University and Ignatius Ajuru University of Education on the extent to which data analysis is a Panacea for Unemployment

Variable	N	∑X	∑Y	X^2	Y^2	∑XY	r	Df	t-cal	t-crit	∝	Remark
Data analysis	105	284.25		792.06		758.9	-0.08	103	-0.82	2.00	0.05	Retained
Unemployment reduction	105		281.16		787.65							

Source: Field Survey Data (2024)

The analysis in Table 6 revealed that the t-calculated is lesser than t-critical (t-cal<t-crit). Hence the hypothesis was retained. Therefore, there is no significant relationship between social media marketing and unemployment reduction among Business Education graduate students in Rivers state universities.

Discussion of Findings

The researcher presented the discussion of findings as follows;

Relationship between content creation and unemployment reduction

The analysis in Table 1 showed that (r = -0.38) indicating that a negative low relationship exist between content creation and unemployment reduction. This connotes that an increase in content creation is likely to decrease unemployment among Business Education students in Rivers state universities. It is in line with thetha digital (2023) that revealed digital marketing as a means of creating job opportunities such as content creation which would subsequently help in reducing the rates of unemployment. Also as a means for unemployment reduction, Kehinde and Olatunde (2022) opined skills such as e-commerce which can be content creation as panacea for unemployment. The null hypothesis for research question 1 was retained indicating that there is no significant relationship between content creation and unemployment reduction among Business Education graduate students in Rivers state universities. The researcher therefore is of the opinion that business education graduates ought to take content creation seriously as it will engage their time meaningfully and serve as a means for entrepreneurial activity, thereby reducing unemployment among them.

Relationship between Social Media Marketing and unemployment Reduction

Based on the data collated, findings in research question two revealed a positive low relationship between social media marketing and unemployment reduction among Business Education graduates in rivers state universities. This implies that there is a slight decrease in unemployment among Business education graduate students with the increase in social media marketing. These findings are in agreement with the view of Adam (2023) who stated that Social media marketing helps to share information to build a company's brand, increase sales, and drive website traffic as customers would be attracted to the brand leading to increase in sales of businesses, thus encouraging entrepreneurial activities and reducing the search for employment. The findings give credence to the view of Dalla (2020) who opined that unemployment can be reduced through engaging in social media forum for business activities. As a matter of fact, the media are available, not complex and can add value to students when effectively utilized. From the findings, it can be deduced that social media marketing usage for entrepreneurial activities can aid unemployment reduction and as such, business education graduates ought to explore and utilize its features for business thus a panacea for unemployment. The corresponding hypothesis 2 proved there is no significant relationship between social media marketing and unemployment reduction among Business Education graduate students in Rivers State Universities.

Relationship of data analysis and unemployment reduction

Based on the findings in research question three, it proved that there is a negative low relationship between data analysis and unemployment reduction among business education graduate students in Rivers state universities. This finding buttresses the need for acquisition and application of data analysis skills among business education graduate students for unemployment reduction as the increase of data analysis have the tendency of reducing unemployment. This finding supports the view of Anudu (2019) who reported that skills such as data analysis being a digital marketing skill can reduce unemployment rate as it has the ability to keep graduates busy as well as giving them an opportunity for decent earning. This would equally enable Business education graduates to be in-tune with business opportunities as they carry out business analysis. The corresponding hypothesis 3 proved that there is no significant relationship between data analysis and unemployment reduction among Business Education graduate students in Rivers state universities.

Conclusion

Based on the results and findings of this study, the researcher concluded that digital entrepreneurial marketing is a Panacea for unemployment among Business Education Students as Students would be able to utilize digital marketing skills. It also creates jobs opportunities without borders to enable Business Education students to work from anywhere and with flexible working hours.

Recommendations

Based on the findings and conclusion drawn from the study, the following recommendations were made;

1. Students should develop content creation skills to build more awareness and generate more leads.
2. Students should utilize their social networking handles for marketing purpose as it has proven to be very beneficial in marketing product in the digital era.
3. Seminars should be organized for students periodically to update their knowledge as regards data analysis, communicate socially and professionally using email, messaging and social media.
4. Business Education graduates should be properly equipped with the following entrepreneurship skills, such as, organizational skills, money management skills, networking and people’s skills.

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SMART GRID TECHNOLOGY INTEGRATION IN NIGERIA'S POWER SYSTEM

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Abstract

Stable and affordable electrical power is a vital requirement for development and growth of any economy. In Nigeria, electrical power is generated from two major sources – Hydro source and Thermal source and deposited in the National grid from where it is transmitted and distributed to consumption centres. Power system is more exposed to the environment and thus the rate at which faults or disturbances occurs is high. Beside the power plants and some high transmission lines, every other information acquisition vis-à-vis fault occurrence, detection and clearance is done manually by personnel patrolling the lines. Hence, a long period of time is wasted and minor fault can degenerate into severe fault. Therefore a system that is more reliable and responsive is required to arrest this problem. The smart grid system is the option to adopt. Smart grid system facilitates bidirectional movement and measurement which creates an environment for small localized generations and renewable energy operator to push their unused power back to the grid and get accurately paid for it. This research article examines the capacity, composition and viability of smart grid system for Nigeria, as remedy to energy challenges facing the power providing companies. This will not create but transform the existing opportunities for affordable and sustainable growth in the economy of Nigeria.

Keywords: *Electricity, Smart Grid, Power System, Renewable Energy, Nigeria*

Introduction

The necessity and benefits of electricity to any nation cannot be over emphasized. The power utility is the bedrock for the growth and development of any nation because it will stimulate the development of every other sector thereby leading to rapid social and economic growth.
The purpose of exploiting smart grid in developing countries such as Nigeria is to examine the sustainable means of providing power system that is automated and intelligent technology based; which will take care of the power problem, thereby combating unreliable grid.

Smart grid is also called other names including "Smart Electric Grid," "Intelligrid," and "Future Grid". The smart grid increased efficiency and reliability is expected to reduce consumers' cost and carbon (II) oxide emission.

The idea of smart grid is fast growing in the power industry. The smart grid technology can gradually be introduced into the national grid that is not reliable and consumer friendly so as to put an end to the increasing struggle for reliable electricity supply necessary for sustainable development in the country. Therefore to achieve this sustainable development, the power system must move to the emerging smart grid technology.

The main aim of smart grid is to increase customer participation and be involved in decision making so as to create a reliable operational system whereby both utilities and consumers can interact.

It is imperative to have a robust and dynamic generation, transmission, and distribution network to have an efficient power system in Nigeria which is achievable by the successful deployment of a smart grid based system. This paper discusses and analyses the various smart grid technologies utilised in the generation, transmission, distribution and the prospects, challenges, and solutions of smart grid system deployment and integration into the existing traditional Nigerian power grid.

Figure 1 depicts the organisation and taxonomy of a typical smart grid system.

Figure 1: Different Elements of Smart Grid Architecture

SOURCE: *Padmanaban S., Bhadoria R.S., Blaabjerg F., Holm-Nielsen J.B. and Nathani S. (2019)*

Objectives

This study examined the impact of integrating Smart Grid Technology into Nigeria power transmission and distribution system. Specifically, the study;

1. Examine the importance of smart grid technology for effective development of Nigeria power transmission and distribution.
2. Review the challenges that may hinder the integration of smart grid technology in Nigeria power system.

Guidelines

1. The prospects for the successful deployment of smart grid systems in Nigeria.
2. The challenges that may possibly impede the successful deployment of smart grid technologies into Nigeria's power transmission and distribution system?

Basic Elements of a Smart Grid

Smart Grid architecture is very important to help manage the complexity of visualizing the challenges associated with system implementation and operation. Taking precautions prior to implementation helps reduce risks.

The implementation of smart grid infrastructure is pretty much sophisticated and complex. This also is very costly as compared to conventional electricity distribution system which is readily available with us. The architecture of smart grid as depicted Figure 2 is majorly composed of following.

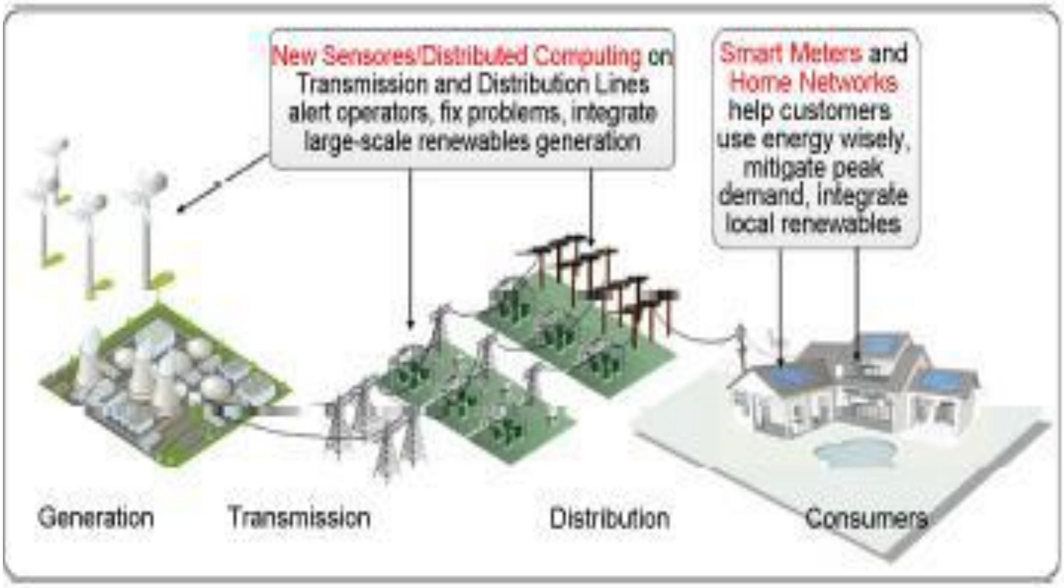

Fig. 2: A Simple Smart Grid Architecture

Source: *Ayaz k, Sulemani M.S. and Ahmed N. (2017).*

Transmission Stations: A transmission stations is where electric power is transferred from different generation sources to the distribution centers. The power generated is sent via the transmission lines to the distribution centers for further supply to the final consumer (user). This section of a typical power system requires the integration of smart devices in order to ensure a more effective operation that can minimize energy losses.

Distribution Centers: This is the place where a lot of operation takes place. Distribution centers receive power from transmission stations and redirect them to the consumers. Important tasks like fault detection, energy theft, load balancing and distribution and switching between various transmitting stations of thermal, tidal, hydro-electric power plants takes place in this section. The integration of smart monitoring devices will ensure proper operational efficiency.

IoT Devices: Smart Grid system cannot be realized without IoT devices. These devices (like sensors, actuators, smart meters) can be installed at each strategic point in the complete setup depending on the function it has to perform. They are useful in the process of energy transmission, metering and distribution and serve purposes that reflect the feelings and responses of the consumers. The data collected in the devices is highly treasurable for future pattern predictions and customization of supply.

Review of Some Previous Literature

The digitalisation of the Nigerian power system has been proposed to be the solution to the epileptic power supply (Ezenagu A.O., 2021). This can be actualized through the deployment of smart grid based system in the country. Smart Grid (SG) denotes a robust power network that effectively incorporates all connected components via a synchronising process that optimises all phases of the network (Dada, 2014). Tsado et al. (2012) addressed some basic smart grid technologies. The work presented a model developed to illustrate the Demand Response System (DRS) application in the smart grid distribution network and also evaluated the benefits of using it in combination with conventional grids. Arihilam et al. (2014) explored how to tackle the problems of population development, the industrialisation of developing economies, and the protection of fossil fuels in Nigeria through smart grids. The research proposed that efficient data management in this modern energy environment by smart grids be the panacea for the survival of utility companies. The research however did not address the different smart grid technologies that will be relevant to the Nigerian grid division.

Onohaebi and Omorogiuwa (2014) proffered the ideal utilisation of existing and more recent resources of both Independent Power Producers (IPP) and National Integrated Power Projects (NIPP) to improve the country's energy system via smart grid technology at all power system levels. This is increased proficiency, dependability, power quality, lower risk and repairs costs, energy charge reduction, and overall power loss. The adoption and integration of this technology into the Nigerian power system architecture will reduce the building of new generating stations and transmission lines necessary to meet the projected growth in loads. It is recommended that if this innovation is accepted at generation plants, especially since the power industry is encountering transformative changes; it will soon make the country match the demand for electricity with the supply.

Ekpe and Umoh (2019) analysed some literatures on the existing condition of Nigeria's traditional electricity grid. Before considering the magnitude, efficiency, and power generation technologies used by some mini-grid systems currently deployed, the grid's generation, transmission, and distribution sectors were briefly reviewed. It is noted that the majority of mini-grid systems developed rely on renewable sources of solar photovoltaic electricity, and these systems are primarily isolated from traditional grids. With significant but focused investments, many current smart grid technologies can integrate mini-grids into the conventional grid, providing affordable access to citizens. The work provided a top-level schematic regarding how and where to deploy such technologies.

Prospects of successful Smart Grid Integration in Nigeria

Smart Grid is the utmost need of the currently existing out-of-date and obsolete electrical supply system which is vulnerable to frauds and wastage of energy. Building smart grid is the necessity of this present time not only because is almost fraud-proof but also cost efficient and eco-friendly. Therefore, bringing customers into the picture is one of the most prominent features of smart grid system. This technology also deploys renewable sources of energy like wind, tidal, solar and many more. It blends it with other non-renewable sources of energy like thermal. The system is smart enough to switch according to the demand and automatically lowers the load, hence saving money. According to Dahunsi F.M., Abd-Lateef A.O., Melodi A.O., et al (2022), smart grids have been established through research to save 30% more energy than conventional grids. Fault detection still remains one of the burdensome aspects of conventional energy grids because to detect the exact location and kind of fault is a very tedious task which can be made pretty easy by smart grid. Smart Grid automatically detects the fault and location on its own and tries to handle it with pre-defined measures. Other advantages of Smart grid are as follows;

- **Robustness**: Smart Grids is a more robust technology. It means that they are less prone to attacks and easy to manage.
- **Requires less Costs and Expenditure**: Managing and providing the load and power according to the demands lowers the cost and cuts expenditures.
- **More Compatible:** The fact that smart grid utilises various smart devices and other technologies proves this technology is interoperable.
- **More Environmental Friendly**: Since smart grid makes use of both renewable and non-renewable sources, it lowers the harmful emissions and reduces the risk of global warming**.**
- **Provides Smart Storage Facilities:** In a situation where the power generated is more than what was demanded, it also provides smart facilities, which can be utilised as and when required.
- **Suitable Load Balancing Technique**: It has the ability of balancing the load with techniques like switch-configuration. Smart Grid load balancing techniques via simultaneous switch/tie-line/wire configurations and tie-line addition helps save power by storing it when not needed.
- **Highest Security:** Security will be integrated into the design of the smart grid and this will require the implementation of practices and procedures by individual stakeholders. In this regard, the physical and cyber security risks can be managed to the highest standards possible.

This novel technological transformation has been highly impactful and has generated great momentum. There have also been a tremendous number of innovations coming up which would never have been possible without electricity.

These inventions when combined with the smart grid technology would completely revolutionise the way we view and operate events in the world. As the large cities are growing larger, the challenges which lie ahead are becoming much bigger. Integrating the infrastructure according to the digital age is where the major benefits of smart grid rest. This technology can be used to establish the basic foundation of smart city whose underlining facets contain water and gas supply, remote light monitoring, traffic control, public safety, efficient utility management and many more. This makes the economic and social system not suitable for the citizens until and unless the electricity distribution system is efficient and robust.

Features and Characteristics of the Existing and Smart Grid

The smart grid has self-healing, adaptability for energy generating and storage, active customer engagement, new market penetration, improved quality of power offerings characteristics and better system stability. Table 1 summarises the comparison between the existing grids and smart grids. A smart grid provides further advantages such as knowledge flow, efficiency, reliability, control and communication, making the power grid reliable for adequate power supply (Shaukat et al., 2018).

Table 1: Comparison of General Features of the Existing Power Grid and Smart Grid System

Basis Consideration Factors	Existing Grid	Smart Grid
Customer Interaction	Bounded	Broad
Metering	Analog and Electromechanical	Digital, Real Time and Automated
Fault Detection and Correction	Manuel	Automatic, Auto-Restoration
Power Flow Control	Finite and limited	Automated and Comprehensive
Reliability	Reactive Protection	Pro-active Protection
Losses on Transmission and Distribution Lines	≥ 10% (Amuta, E., Wara, S., Agbetuyi, A. and Matthew, S., 2018)	≥ 2% (Amuta, E., Wara, S., Agbetuyi, A. and Matthew, S., 2018)
Information Flow	Single Direction	Bi-Directional
Power Generation	Central	Distributed
Environmental Pollution	Very High	Relatively Low
Grid Overall Efficiency	Low	High
Monitoring	Manuel	Automated
Energy Quality	Non-Essential	Essential with Price Relation Factor
New Products and Services	Limited Power Integrated	Full Power Integrated
Energy Generation and Storage	Primary Sources	Renewable Energy Sources
Operating System Integration	Low Degree Integration	High Degree Integration
Price Information	Not Reliable and Available	Reliable Full Price Information
Switching Method	Manuel	Automated
Communication	Non-Interactive (Non-Real Time)	Interactive (Real Time)
Sensors Usage	Few (Limited)	Many (Unlimited)
Participation	Superficial	Intensive
Control	Limited	Pervasive
Fault Response	Failures and Blackouts	Adaptive and Islanding

Source: *Dahunsi F.M., Abd-Lateef A.O., Melodi A.O., Ponnle A.A., Sarumi O.A. and Adedeji K.A. (2022)*

Challenges of Smart Grid Integration in Nigeria

A. Lack of Routine Maintenance Culture: The significant concern is the poor maintenance culture demonstrated over time in the power sector. The only evident maintenance performed by utility workers is getting rid of immediate identified fault. In contrast, scheduled maintenance is non-existent for power infrastructure optimal functioning and life cycle elongation. As such, even with an increase in generating capacity with the deployment of an intelligent grid, capacity may still be limited. (Akpojedje et al., 2016).

B. Poor Regulatory Policies Implementation and Low Budgetary Allocations: Poor regulatory policies and implementation in most developing nations serve as a barrier to smart grid deployment because consistency and a well-driven strategy are imperative for the sustainable execution of projects.

Regulatory bodies such as the Nigerian Electricity Regulatory Commission (NERC) are placid in performing their primary responsibility to regulate the power sector as the relevant power stakeholders do not follow the rules (Akpojedje et al., 2016). Considering the price of smart grid deployments, many developing nations (like Nigeria) low budget allocations are another barrier to increased funding. Excellent and consistent regulatory policies will be helpful in the implementation of smart grid technology (Otuoze *et al.*, 2017).

C. Cyber-attacks, Infrastructure Theft, and Terrorism: Cyber-attacks are global phenomena that affect nations, companies, organisations, security services, and infrastructures. They can damage, corrupt hardware and software facilities that control the smart grid. In addition, smart grid relies on information technology, making it vulnerable to cyber threats (Reddy et al., 2014). Globally, developed countries spend billions of resources are spent to combat the menace and adverse effect of cyber-attacks with many developing nations like Nigeria budgeting little to counter cybercrimes. Therefore, smart grid deployment in Nigeria must be accompanied by well-structured cyber security for a secure and resilient system (Otuoze et al., 2017).

D. Transmission and Distribution Infrastructure Vandalization: Before the recent power sector reforms, Nigeria's transmission infrastructure and distribution equipment vandalism were at a very high occurrence rate. Vandalism of Nigeria's electrical infrastructure is one of the significant issues that could stymie the country's deployment and integration of the smart grid. (Emodi et al., 2014).

E. Renewable Energy Sources Production Volatility: Renewable energy sources are based on natural phenomena, which vary based on environment (vegetation), time of the day, weather condition, and season of the year, among other factors. These variations would make it challenging to generate constant power throughout the day, month, and year. The generated electricity would be safely absorbed into the grid if the frequency is kept within an appropriate range using the Ancillary Frequency Support Service (FSAS). This would complement the recurrent energy generation changes (Aliyu *et al.*, 2018). Depending on the regular environmental forecast, a dispatch strategy for FSAS can be built to absorb changes in renewable energy generation. (Microgrids and distributed energy resources can be utilised to create a network that minimises the adverse effects of power quality problems on present power systems while enhancing sustainability, supply synchronisation and distributed power generation in emergent power systems (Emodi et al., 2014).

F. Insufficient Research, Information and Merchandising of Smart Grid Technology: There is currently no access to records about Nigeria's green energy potential. Hence prospective investors will find it difficult to make business judgements and invest on the exploration and use of renewable energy sources. Therefore, generating and managing such reliable data is paramount to suitable and beneficial system planning and execution.

G. Corruption: The problem of corruption has backtracked Nigeria development among its counterparts. Corruption is an all-pervasive epidemic that has devastated every segment of Nigeria's economy, including the power industry. Numerous corruption instances have caused uproar in the power sector (Ndinechi *et al.*, 2011). In many African nations, corruption has become a way of life for government officials and some highly placed private individuals. Corruption also translates to improved theft, and a strict government penalty against corruption would help improve the deployment of smart grid system (Otuoze *et al.*, 2017).

H. Lack of Institutional Coordination and Organisation: Failure to enforce clean energy policies and coordination among various government agencies has created inconsistencies that hinder the growth of renewable energies. Nigeria's renewable energy sector appears dwarfed compared to other countries such as Egypt, Kenya and South Africa due to a lack of apparent government supervision and direction, weak regulatory systems, and insufficient human capital, compounded by limited government backing. There is currently little hope of a fast change to a green economy, as there is no effort to empower rural folks with education and awareness of simple renewables (Ikem *et al.*, 2016).

Way Forward

Despite advances, significant hurdles still exist in every section of the power sector value chain. If electricity is to meet demand in the foreseeable future, these issues must be handled appropriately. The anticipated long-term success of power sector is dependent on the sustainability at all the stages of the value chain, from generation through end-user payment. As a result, the government must enact cost-reflective tariffs that reflect market reality. Policies encouraging the use of renewable energy should also be implemented to supplement existing energy sources. Energy regulatory bodies should create frameworks that promote transparency and accountability. This will make it easier for entities like Nigeria Electricity Management Services Agency (NEMSA) and National Electricity Regulatory Commission (NERC) to collaborate and coordinate their efforts.

The role of state and municipal governments in supporting and enabling mini-grid development is critical. They should take on more responsibility for advancing the process. To empower private players to realise the off-grid market potential, create an enabling environment for off-grid development, including more explicit criteria for mini-grid development, assistance for skills and training, and more supportive legislation. Existing regulations should be used to clarify provisions. For example, policies around distribution firm development plan reporting should be explicit and adequately implemented to alleviate operators' uncertainty.

Based on the prospects, issues, and challenges of smart grid deployment in Nigeria, some policy and regulatory changes would need to successfully introduce renewables and smart grid technology into the Nigerian power sector. This will contribute to energy supply and economic improvement.
Here are some guidelines and steps:

1. Develop renewable energy standards and standard compliance with international standard renewable energy cooperation bodies.
2. Implementing renewable energy standardisation policy, organisation, budget, and human resource development laws would ensure that any renewable energy product imported by an importer into the country is provided with after-sales customer support (ASS).
3. Energy data study research should be conducted on off-grid power generation, customer consumption profile and renewable energy.
4. Establish an updated National Energy Archive to adequately assist the Nigerian government and global organisations in evaluating the energy situation.
5. Energy education programs should be mandated at all levels of schools in Nigeria which will incorporate good maintenance culture.
6. Energy quality criteria for household, office and industrial appliances and equipment are improved by requiring the exclusive and mandatory use of low-energy appliances, electric lights, and equipment.
7. Infrastructure upgrades, deployment of transmission enhancements solutions, and a transmission policy framework that encourages off-grid renewable solutions.
8. Establish research and development centres in educational institutions.
9. Government should establish a special commission that will collaborate with National Security Civil Defence Corp to counter corruption, vandalization, theft, cyber-attacks against electricity infrastructure nationwide.

Conclusion

The unbundling of PHCN, coupled with smart grid technology inclusion, would open up the prospect for electricity consumers and providers to explore renewable energy sources and distributed energy to meet power needs. Smart grid provides competencies to defy and solve various challenges facing Nigeria's power sector. Aside from confronting these challenges, the smart grid would immensely benefit the country's electricity stakeholders by providing paybacks in various aspects of security, economy, and reliability of the power system in the country. Smart grid would also provide accurate data that power system planners can use for forecasting power system load at every aspect of the power system. The role of power system planning cannot be overemphasised as it serves as the basis for any development in Nigeria energy sector.

However, it will be impossible to ground the whole country for an extended time to make the existing grid network setup smart with a complete change of existing power equipment with intelligent ones. Some important areas such as smart metering, distributed generation, and ICT should start implementing smart technology while tending towards a gradual overhaul in avoiding a total breakdown of the power sector. The application of a decentralised system such as microgrid and distributed generation should be utilised. The use of microgrids would also bring about reduced power losses.

Suggestions

To ensure the smooth deployment of the smart grid in Nigeria, the following factors should be considered.

1. Strict adherence should be made to standardising technologies for smart grid applications.
2. Regulatory bodies must be brave enough to perform their statutory duties, and discipline investors misled or harmed by the existing law.
3. In the future, the power industries must be compelled to do research and collaborate with scholars in carrying out research.
4. Important deadlines must be set and met, as laid down in the regulatory policies related to the implementation of Smart Grids.
5. Scholars should be mandated to carry out developmental research that can contribute to the nation's growth.
6. The distinct gap in the technical know-how of smart grid technology could impede the deployment of an intelligent grid. To support smart grid engineering, there has to be a significant restructuring and training of engineers and technicians in integrated skills of the developing and emerging technology area of the smart grid. As such, the skill gap should be closed.
7. The government needs to raise public awareness about the need for citizens to protect public infrastructure jealously.

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Attitude of Students towards News Analysis on Melody FM, Warri

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Abstract

This research study investigated the attitude of students towards news analysis on melody Fm, Warri. Three objectives guided the study and three research questions were answered. The population of the study consisted of 16,860 students of College of Education, Warri. The sample size used for the study was 120 students derived via the use of purposive sampling of non-probability sampling technique. The instrument for data collection was a structured questionnaire. The instrument was validated by three experts from the institution. The reliability of the instrument was determined through the use of Crobach Alpha and a reliability coefficient index of 0.71 was established. Simple percentage and tables were used for the data analysis. The study revealed that students have negative attitude towards news analysis on Melody Fm, Warri. Equally, college of Education students Warri, listen to melody Fm, Warri. The study recommended that students should be given orientation on the importance of listening to news analysis.

Keywords: *Attitude of student, News, News analysis, FM.*

Introduction

Radio news analysis is also known as news commentary. It has to do with explanation and analysis of news for easy and proper understanding and nobody can throw them into the trash or discard them. Any medium, be it electronic or print services by the type of services it renders to the public and for any media house to be responsible, it has to gain the goodwill of the people it serves. The need to be socially responsible necessitated the adoption of public affairs reporting and radio news interpretations which are invaluable too tools for media organizations today.

The society in which we are living today has become so sophisticated and complex that mere straight news can no longer make the public understand the events. It therefore becomes necessary that the mass media have to interpret news through the use of news analysis or commentaries so as to make them more understandable to their targeted public, stimulate thought and form opinion/attitude. Most radio stations give their news analysis after the day's main news. Delta State broadcasting service radio Fm broadcasts news analysis at 7am. News analysis bothers on the particular and peculiar topic that demands public interest due to its importance to the public. News analysis centers on such topics as "Winning war against Covid-19", Female child education', etc.

News commentaries tend to educate the members of the society on important burning issue in around them. The topic at hand is so much interpreted to the understanding of everyone, even their level to enable them for their opinion. Nevertheless, students do not as such patronize news analysis. Research reveals that most students of these days go for entertainment programmes on radio such as drama programmes. It is quiet unfortunate that only the aged appreciate the educative, informative and enlightening programmes of news analysis on radio. Furthermore, the daily dissemination of information has for long been the work of the mass media. Media houses have developed and it is a machine for social change and opinion formation. The broadcast media appeal to individuals and transcend largely a number of barriers to penetrate the society irrespective of status.

Radio analysis commentary is important in our social, political and economic life because it is a tool for changing and molding of attitudes and opinions. Such factors are culture, family role, individual differences, and reference groups, backgrounds etc. students of tertiary institutions are directly or indifferently affected by each factor.

This study is set to critically examine the attitude of students towards news analysis on melody Fm, Warri, among the students of college of education, Warri. The issues of opinion formation or attitude formation is capable of building or destroying a person, group, institution or even a nation when the right opinion or attitude about an action of particular set of people is not formed by others, it can lead to deep-rooted sentiments, misinterpretations, wrong captions, and ideas which can eventually lead to the collapse of such an organization or even government. It is therefore in the light of the above identified importance of good opinion formation that these researcher decided to find out how radio Fm news commentary have affected the formation of attitude among the students of college of education, Warri.

Overview of Broadcasting

Broadcasting has been defined by various authors. Egbon cited in Umolu (2014) defined Broadcasting as "the transmission of radio and television signals to a wide heterogeneous audience". This simply means that the audience of a broadcast programme is scattered over distance and are reached simultaneously (at the same time). Broadcasting can also be looked at as the distribution of audio/video content to a dispense audience via and electronic mass communication medium. Broadcasting therefore breaks the barriers of distance. The term "broadcasting" which is derived from the method of sowing seeds in a field by casting them broadly about, was originated in the early days of radio, to distinguish radio broadcasting from methods using wired transmission (as in telegraph and telephone) or that were intended as person to person communication.

Broadcasting has also been defined as the distribution of audio and/or video content to a dispersed audience through any electronic mass communication medium, but typically, one using the electromagnetic spectrum, in a one-to-many model. In radio/television broadcasting, signals from a broadcast station are transmitted as electromagnetic waves through the transmitter to the homes of the consumer of the broadcast messages. The reach of a broadcast is such that no matter your location, as long as the technology as the technology for transporting such a message is readily available, there is nothing stopping it. The signals of a broadcast station could be in the form of music, sound, video etc. As music opposed to other forms of mass communication, like newspapers, magazines and book (print media) broadcasting is an entirely electronic means of communication, because it uses electronic technology to transmit messages.

Newspaper, on the other hand is not in the family of the electronic media because it does not use electronic technology in all the stages of reaching its final reader. However, there are now online or internet based newspapers designed, produced and distributed electronically, using new forms of technology. Broadcasting is distinguished from "cable casting" which is the transmission of television and sometimes radio signals directly to the homes of consumers, by means of coaxial cables. Whereas broadcasting is open to everyone, provided you have a television or radio receiver, cable is restricted and its services are excessively available to only those who have decoders and are subscribers to such stations. Similarly, broadcasting, from its definition and meaning, is distinguished from narrowcasting", which is the transmission of special interest programmes to a much smaller audience, as against the broad and large ones of broadcasting.

Evolution of Radio Broadcasting

Radio broadcasting is the transmission of electromagnetic signals through the atmosphere or free space. This simply means that radio signals are spread out in all directions, from a central point (broadcast studio) to listeners and potential listeners (heterogeneous audience) with a decoding device (radio set) to receive signals. Radio transmission is only possible with the aid of a transmitter installed in the radio station. The Webster Dictionary (2010) defines radio as the science, art and process of communicating by means of a radiant energy transmitted directly through space in waves. Radio is believed to be the first known system of mass communication in the world. The evolution of this medium is somewhat contributory. It is contributory in nature because, it is not an invention of one man. However, Guglielmo Marconi is most associated with the advent of radio. Broadcasting began as transmissions which only carry dots and dashes of the wireless telegraph.

The wireless telegraph is a transmission of electric telegraphic signal without wire. Radio broadcasting his began with audio sound broadcasting service which was broadcasted through the air as radio waves from transmitters to antennas.

In early 1873, James Maxwell was able to prove mathematically that electromagnetic wave could propagate through free space. Edwin Houston, Elihu Thomson and Thomas Edison in 1875 and David Edward Hughes in 1878, noticed that electrical sparking could be detected at a distance. At this time, no connection was made with Maxwell's theories and it was written off as electromagnetic induction. In 1886, Heinrich Rudolf Hertz in his research noticed the same sparking phenomenon and was able to conclusively demonstrate the existence of airborne electromagnetic waves in an experiment that substantiated Maxwell's theory of electromagnetism. The discovery of these waves prompted many experiments by physicist. Oliver lodge, a British Scientist in 1894 during a lecture, transmitted and received Hertzian waves at distances up to 50 metres. This demonstration was advanced a year later with experiment by Jagadish bose. Startin in late 1894, Guglielmo Marconi worked on bring radio out of the lecture halls and Laboratories by perfecting the wireless transmission. The wireless telegraphy is the transmission of electromagnetic implilse without the use of wires. By 1896, he had patented a system of apparatus that became commercially important.

The Features of Radio

Inspite of the worrisome generalization that mass media cannot do more than creating awareness regarding any development project (Klapper, 1960) radio has continued to wax stronger as a medium of the people we regard it as a medium of the people because radio has become a common sight in rural areas in particular, it is on unusual to see people tie a radio set around their waist while climbing trees or tilling the ground. Onyekwere (1990) obviously sounds the same not where she posits, that" with the exception of radio which has be found to be effective in reaching the rural Nigeria masses. Other channels of mass media communication have been found to be relatively less effective. Also, Ansah (1991) agree that of all the mass media generally available to Africans, radio is the wide spread and accessible. Obviously, radio has over riding advantages over other media of mass communication. Some of these advantages are:

1. Radio appeals to illiterate audience as development news and programme can be broadcast to them not just in their native languages but also in their local dialects
2. Radio breaks the barrier of distance, as it reach its amazingly wide and highly penetrating
3. Radio is relatively cheap compare to other channels of mass communication
4. It breaks the barrier of power outage as it can easily be operated using dry cell batteries
5. Radio appeals to audience sense in which case one can easily get expose to it while doing other things. Radio has the power of on-the-spot live transmission, thereby keeping people living at the periphery adequately informed about government policies, actions as well as providing information about people living in other lands

News Analysis

News analysis refers to the measurement of various qualitative and quantitative attributes of textual (unstructured data) news stories. Some of these attribute are; sentiment relevance, and novelty. Expressing news stories as numbers and metadata permits the manipulation of everyday information in a mathematical and statistical way. This data if often used in financial markets as part of a trading strategy or by businesses to judge market sentiment and make better business decisions. News analytics are usually derived through automated text analysis and applied to digital texts using elements from natural language processing and machine learning such as talent semantic analysis, support vector machines, "bag of words" among other techniques.

The application of sophisticated linguistic analysis to news and social media has grown from an area of research to mature product solutions since 2007. News analytics and news sentiment calculations are now routinely used by both buy-side and sell side in alpha generation, trading execution, risk management and market surveillance and compliance. There is however a good deal of variation in the quality, effectiveness and completeness of currently available solutions. A large number of companies use news analysis to help them make better business decision. Academic researchers have become interested in news analysis especially with regards to predicting stock price movements, volatility and traded volume. Provided a set of values such as sentiment and relevance as well as the frequency of news sentiment scores for multiple asset classes such as equities forex, fixed income, and commodities. Sentiment scores can be constructed at various horizons to meet the different needs and objectives of high and low frequency trading strategies, whilst characteristics such as direction and volatility of asset returns as well as the traded volume may be addressed more directly via the construction of tailor made sentiment. Socres. Scores are generally constructed as a range of values. For instance, values may range between 0 and 100, where values above and below 50 convey positive and negative sentiment, respectively.

Statement of the Problem

The issues of opinion formation or attitude formation is capable of building or destroying a person, group, institution or even a nation when the right opinion or attitude about an action of particular set of people is not formed by others, it can lead to deep-rooted sentiments, misinterpretations, wrong captions, and ideas which can eventually lead to the collapse of such an organization or even government. It is therefore in the light of the above identified importance of good opinion formation that the researcher decided to find out how radio Fm news commentary have affected the formation of attitude among the students of College of Education, Warri.

Meanwhile, in the course of studying the statement of problem of this research study, however, there exist the problems of ascertaining the right time to reach the students of college of education, Warri. With the presence of many other radio stations, how do we know if the students of College of Education Warri listen to Melody, Fm, let alone the news analysis programme of the station? Another problem has to do with knowing the right time to reach the students with the news analysis. All these are the hitches that this research encounters in an attempt to study the attitude of students towards news analysis on melody, Fm, Warri.

Purpose of the Study

In a broader perspective, this research tends to determine the attitude of students towards news analysis on Melody Fm, Warri. The study specially seeks among other things;

1. To ascertain if the students of College of Education, Warri are exposed to news analysis on Melody Fm, Warri.
2. To determine the attitude of student of College of Education Warri towards news analysis on Melody Fm, Warri.
3. To find out how often the students of College of Education Warri, listen to news analysis on melody Fm, Warri.

Research Questions

The following questions were answered;

1. Are the students of College of Education Warri exposed to news analysis on Melody Fm, Warri?
2. What is the attitude of students of College of Education Warri towards news analysis on Melody Fm, Warri?
3. How often do the students of College of Education Warri listen to news analysis on melody Fm, Warri?

Methodology

Research design according to Ifedon and Ifidon (2007) is the blue print or plan which determines the nature and scope of study carried out or proposed. The descriptive survey research design was used for the study.

A study population is the total of the critical analysis on aggregate of which is the total of the number of persons or objects for investigation (Nnamani, 2004). The population of the study consists of the 16,860 students of College of Education, Warri. The sample size used for the study was 120 students of College of Education, Warri. The purposive sampling of non-probability sampling technique was adopted. The purposive sampling or judgmental sampling involves the hand picking of the desired sampling elements. The instrument for data collection was a structured questionnaire. The questionnaire covered all related areas and contained different types of questions in order to create varieties that may interest the respondents so as to elicit relevant data for this study. The questionnaire was divided into two parts or sections. Section A was personal data namely: Sex, Age range, marital status etc. section B focused on general knowledge on the topic drawn from the research question. The data collected was presented in a tabulated form with focus on the major research questions in other to enable the researcher determine the results. Data collected was analyzed using simple percentage and tables for easy understanding. The formular used was:

$\frac{f}{n} x \frac{100}{1}$

Where:
f – frequency of response
n – number of respondents

The researcher administered one hundred and twenty copies (120) of questionnaire to the selected students of College of Education, Warri. Thereafter, one hundred and eighteen (118) copies were retrieved, whereas only two (2) copies were lost. The percentage of the retrieved copies of questionnaire was calculated thus:

$$\frac{118\ x\ 100}{120} = 98\%$$

Therefore, the total returned copies used for the study (n-114) which represents 98% of the sample of study.

Results

The collected questionnaire or data was presented in tables. This is because it makes it easy to comprehend.

Table 1: Sex

Sex	Frequency	Percentage
Male	49	42
Female	69	58
Total	118	100%

The above table showed that 42% of the respondents were male while 58% of the respondents were female.

Table 2: Age Range Distribution

Age Range	Frequency	Percentage
16-20	68	58
21-30	46	39
31 and above	4	3
Total	118	100%

The above table showed that 58% of the respondents were within the age range of 16-20. 39% of the respondents showed that the respondents showed that the respondents fell within the age range of 21-30 years, while 31 years and above of the respondents constitute 3%.

Table 3: Marital Status Distribution

Marital Status	Frequency	Percentage
Married	14	12
Single	104	88
Total	118	100%

The above table showed that 12% of the respondents were narried while 88% of the respondents were single

Table 4: Programme Distribution

Programme	Frequency	Percentage
Full Time	78	66
Part Time	40	34
Total	114	100%

The above table showed that 66% of the respondents were in full time programme while 34% of the respondents were in part time programme

Table 5: Students of Collage of Education Warri, are exposed to view analysis on Melody Fm, Warri

Response	Frequency	Percentage
Strongly agree	80	68
Agree	20	17
Undecided	10	8
Disagree	8	7
Strongly disagree	-	-
Total	118	100%

The above table showed that 68% of the respondents indicated strongly agree, 17% of the respondents indicated agree, 8% of the respondents indicated undecided while 7% of the respondents indicated disagree.

Table 6: Students of College of Education, Warri listen to news analysis on Melody Fm

Response	Frequency	Percentage
Strongly agree	100	85
Agree	13	11
Undecided	5	4
Disagree	-	-
Strongly disagree	-	-
Total	118	100%

The above table showed that 85% of the respondents indicated strongly agree. 11% of the respondents indicated agree while 4% of the respondents indicated undecided to item 6 in table 6 above.

Table 7: Students do not listen to news analysis regularly

Response	Frequency	Percentage
Strongly agree	98	83
Agree	10	8
Undecided	3	3
Disagree	-	-
Strongly disagree	7	6
Total	118	100%

Information in table above showed that 83% of the students indicated strongly agree, while 8% of the responds indicated agree. However, 3% and 6% of the respondents indicated undecided and strongly disagree

Table 8: Students have negative attitude towards news analysis on melody Fm Warri

Response	Frequency	Percentage
Strongly agree	80	68
Agree	30	25
Undecided	-	-
Disagree	5	4
Strongly disagree	3	3
Total	118	100%

The table above showed that 68% of the respondents indicated strongly agree. 25% of the respondents indicated agree while 4% and 3% of the respondents indicated disagree and strongly disagree to the item 8 in table 8 above

Table 9: Students do not like listening to news analysis to melody Fm Warri

Response	Frequency	Percentage
Strongly agree	78	66
Agree	29	25
Undecided	5	4
Disagree	6	5
Strongly disagree	-	-
Total	118	100%

The above table showed that 66% of the respondents indicated strongly agree, 25% of the respondents indicated agree. 4% of the respondents indicated undecided while 55 of the respondents indicated disagree

Table 10: News analysis comes up at 7am when students are getting ready for lectures

Response	Frequency	Percentage
Strongly agree	108	92
Agree	-	-
Undecided	6	5
Disagree	-	-
Strongly disagree	4	3
Total	118	100%

The above table showed that 92% of the respondents indicated strongly agree, while 5% and 3% of the respondents indicated undecided and strongly disagree.

Table 11: College of Education students, Warri listen to melody Fm, Warri seldomly

Response	Frequency	Percentage
Strongly agree	90	76
Agree	20	17
Undecided	18	7
Disagree	-	-
Strongly disagree	-	-
Total	118	100%

The table above showed that 76% of the respondents indicated strongly agree. While 17% and 7% of the respondents indicated agree and undecided

Table 12: Irregular power supply does not allow college of Education students to listen to news analysis

Response	Frequency	Percentage
Strongly agree	92	78
Agree	18	15
Undecided	8	7
Disagree	-	-
Strongly disagree	-	-
Total	118	100%

Information in the table above showed that 78% of the respondents indicated strongly agree, while 15% and 7% of the respondents indicated agree and undecided.

Table 13: Melody Fm news analysis is broadcast at inappropriate time for the college of education, Warri students

Response	Frequency	Percentage
Strongly agree	100	84
Agree	-	-
Undecided	8	7
Disagree	7	6
Strongly disagree	3	3
Total	118	100%

The above table show that 84 of the respondents indicated strongly agree, 7% of the respondents indicated undecided while 6% of the respondents indicated disagree and strongly disagree.

Table 14: College of Education students make use of social media for news information more than radio

Response	Frequency	Percentage
Strongly agree	80	68
Agree	20	17
Undecided	10	8
Disagree	-	-
Strongly disagree	8	7
Total	118	100%

Data from the above table showed that 68% of the respondents indicated strongly agree,17% of the respondents indicated agree, while 8% and 7% of the respondents indicated undecided and strongly disagree.

Answer to Research Questions

Research question one: Are students of College of Education, Warri exposed to news analysis on Melody Fm, Warri?

In providing answer to the research question one information in tables 5 and 6 will be used. In table 5, 68% and 17% of the respondents indicated strongly agree and agree that students of college of education, Warri are exposed to news analysis on melody, Fm, Warri only 8% and 7% of the respondents indicated otherwise. Similarly, in table 6, 85% and 11% of the respondents indicated strongly agree and agree that students listen to news analysis on melody Fm 4% of the respondents indicated undecided.

Research question two: What is the attitude of students of College of Education, Warri towards news analysis on melody Fm, Warri?

In answering the research question two, information in tables 8 and 9 would be used. In table 8 however, 68% and 25% of the respondents indicated strongly agree and agree that students have negative attitude towards news analysis on melody, Fm, Warri. Also in table 9, 66% and 25% of the respondents indicated strongly agree and agree that students do not lack listening to news analysis on melody Fm, Warri.

Research question three: How often do the students of College of Education, Warri listen to news analysis on melody Fm Warri?

In answering the research question three, however, information in table 11 would be used. In table 11 76% of the respondents indicated strongly agree alongside 17% of the respondents indicated strongly agree alongside 17% of the respondents that indicated agree that college of education students, Warri listen to melody Fm Warri seldomly. Only 7% of the respondents indicated undecided

Discussion of Findings

The finding in research question one revealed that student of College of Education Warri listen to news analysis on melody FM. This finding aligns to a related research by Bastian and Schmidt (2019) who found out that students tend to prefer news that is interactive and relatable, evaluating not only the content but also its presentation. Factors such as trust in the news source, relevance of topics, and format of delivery influence these attitudes (Meyer, 2021). Dedicating time to the finding of the study for research question analyzing current events on forums like Melody FM can foster critical thinking and informed discussions among students, preparing them for active citizenship.

The finding of the study for research question two revealed that, students of College of Education, Warri have negative attitude towards news analysis on Melody FM Warri. This study is in agreement to a related research by Turner and Miller (2020) which identified social influences, peer discussions, and the perceived credibility of the news source as critical factors affecting how students consume and perceive news. Furthermore, familiarity with the medium can enhance engagement; students who regularly listen to radio are more likely to hold favorable views toward news analysis.

The finding of the study for research question three revealed that, student of College of Education, Warri, listens to melodgy FM seldomly, This study agrees with Nwankwo, (2021) who asserted that while many studies focus on positive engagements with media, it is essential to acknowledge critiques surrounding news analysis. Students may develop skepticism towards media representations, particularly if they perceive biases or misrepresentation of issues that matter to them therefore, fostering media literacy among students is crucial for helping them critically analyze news content and understand the broader media landscape.

Conclusion

This research study has demonstrated that students of college of education, Warri have negative attitude towards news analysis on melody Fm, Warri. The students of College of Education listen to melody, Fm Warri seldomly. This is because melody Fm Warri broadcasts news analysis at the time in the morning when students are getting ready for lectures.

Recommendations

From the findings and conclusions of this research study, the following recommendations are offered:

1. Students should be given orientation on the need to be listening to news analysis as this will develop a positive attitude towards listening to news analysis.
2. Melody Fm should vary the hours they broadcast news analysis to ensure that students of College of Education, Warri are reached at the appropriate time.
3. College of education, Warri authorities should educate their students on the need to be listening to news analysis of melody Fm Warri.

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Quality Assurance Techniques and Administration of Public Secondary Schools in Bayelsa State

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Abstract

The study investigated the relationship between quality assurance techniques and administration of public secondary schools in Bayelsa State. Three research questions and Three corresponding hypotheses guided the study. This study adopted a correlation research design. The study was carried out in Bayelsa State. The population of this study consisted of 648 administrators (principals and vice principals) in 297 public secondary schools in Bayelsa State. The entire population was used as the sample because the number appears to be small and manageable for the study. Thus, census sample technique was employed in this study. The research instrument used in this study is "Quality Assurance Techniques Questionnaire" (QATQ) and 'Administration of Public Secondary School Questionnaire' (APSSQ). The instruments were validated and tested for reliability which gave an overall reliability coefficient index of 0.70. Pearson Product Moment Correlation was used to provide answer to the six research questions posed in the study. The null hypotheses were tested using t-transformation at 0.05 level of significance. The study revealed that school quality assurance measures such as provision of instructional materials, availability of physical facilities and staff development has strong positive correlation with administration in secondary schools in Bayelsa State. It was recommended among others that school administrators should ensure that instructional materials are sufficiently provided for teachers to aid effective instructional delivery and achievement of educational goals and objectives.

Keywords: *Quality Assurance Techniques, Administration, Public Secondary Schools.*

Introduction

Education generally remains the pivot upon which the wheels of society revolve. In all nations, education is regarded as an important aspect of human life that is rationally designed and organized to build human capital to raise their productivity and increase their social, economic and political life. It is universally regarded as a form of investment in humans, which yields both economic and non-economic benefits and contributes to a country's future wealth by increasing the productive capacity of its people (Eluozo & Nwogu, 2019).

Quality remains the most important attribute that creates value about products and services. It focuses on changes as well as identifying gaps in quality, techniques of performance and mechanism for quality control. Assurance refers to the action of instilling confidence, the condition of being definite, or the act of ensuring certainty. Quality Assurance refers to the deliberate and methodical operations carried out inside a system to ensure that the specified standards for a product or service are met to a high standard. Quality assurance refers to the deliberate and organised measures taken to ensure that a product or service meets the defined specifications (Anad, 2004). Quality assurance is a series of protocols that all organizations should implement to ensure that specific standards are consistently defined and achieved for a particular product or service.

Quality in education emphasizes teachers' competence, creativity and commitment, and how educational administrators organize school activities in order to realize the full potentials of all personnel educational institutions.

Quality standards are critical and depend on effective policy planning, implementation and monitoring, quality assurance in education means the pertinent and suitability of the educational programme to meet the needs of the institution and achieve the set objectives (Fadipe, 2019). Idialu (2013) defined quality assurance as ways of managing the educational sector and ensuring that services provided are kept at high standards that will positively affect its products (students). It is better and more rewarding to take steps to prevent failure and wastage in secondary schools, hence the need for quality assurance which is preventive rather than corrective. Quality assurance (QA) techniques in public secondary schools are critical for ensuring that educational standards are consistently met and that students receive a high-quality education. These techniques include a range of strategies such as Provision of Instructional Resources, Availability of Physical Facilities and Staff Development.

Quality assurance (QA) techniques in public secondary schools are essential for maintaining high educational standards and ensuring that students receive a quality education. QA is the provision of instructional resources. This includes textbooks, teaching aids, and digital resources that support the curriculum and enhance the learning experience. According to OECD (2022), access to high-quality instructional resources is closely linked to improved student outcomes and more effective teaching practices. Schools that invest in up-to-date and relevant instructional materials provide teachers with the tools they need to deliver engaging and comprehensive lessons, which in turn benefits student learning (OECD, 2022).

QA technique involves the availability of physical facilities. Physical facilities are fundamental for any educational institution and it is directly connected with school effectiveness as well as educational development. Obviously, physical facilities in the school motivate students to learn. Adequate attention is currently on physical facilities in Nigeria educational system and it has been repeatedly found to have positive relationship with standard and quality of educational system. Well-maintained and adequately equipped classrooms, laboratories, libraries, and recreational areas are vital for creating an environment conducive to learning. According to World Bank (2023), the quality of school infrastructure directly impacts student engagement and academic performance. Schools with modern and well-maintained facilities tend to have higher student achievement levels because they offer a more comfortable and stimulating learning environment (World Bank, 2023).

Staff development is the coherent sum of activities targeted to strengthen and extend the knowledge and skills and conception of a teacher in a way that will lead to changes in their way of thinking and their educational behaviour. Staff development according Cole (2014) is any learning activity that is directed towards further needs rather than present needs of staff and is concern more with career growth than immediate performance. Permida (2017) opined that staff development refers to a variety of education and training activities which are designed purposely to give staff additional knowledge, skills, attitudes, experiences and understanding needed to perform up to required standards. The prerequisite for promotion in educational system in Nigeria, is mostly done on the numbers of years spent in service. It is assumed that every principal have spent so many years as a teacher and therefore has the knowledge to be a mentor to junior teachers thereby serving as mentor.Mentoring is the key element of staff development in educational institution. The School administrators also serve as a mentor to the younger and new teachers.

Effective administration plays a pivotal role in implementing QA techniques and ensuring their success. Administrators are responsible for creating an environment that supports QA practices, including allocating resources, managing facilities, and overseeing staff development. Their role involves setting clear educational goals, establishing performance metrics, and using assessment feedback constructively to drive improvements. Fullan (2001) emphasizes that effective school leadership is essential for fostering a culture of continuous improvement and aligning QA practices with the school's educational mission. Therefore, this study focuses on Quality Assurance Techniques and Administration of Public Secondary Schools in Bayelsa State

Statement of the Problem

To fulfill the purpose of quality assurance in Nigerian education system, scholars had listed some basic techniques and educational management functions that should be streamlined and practiced in similar terms by educational managers in order to enhance quality assurance in the education system. Prominent amongst such techniques is good planning, regular monitoring and evaluation, quality control mechanism, effective supervision and conducive learning environment.

Quality assurance is needed to ensure that the operations of these public secondary schools are aligned with the stated objective for secondary school education. In order to realize quality secondary education in Bayelsa State, the government established agencies and departments of supervision, inspection and quality assurance units and also came out with quality assurance programmes. With all these ministries, agencies and programmes the quality of secondary school education keeps declining.

In public secondary schools, ensuring the consistent application of quality assurance (QA) techniques presents a significant challenge. One major problem is the inadequate provision of instructional resources, which can hinder the effectiveness of teaching and learning. Many schools face issues with outdated textbooks, insufficient digital tools, and lack of access to current educational materials. This deficiency can lead to disparities in educational quality and impact student performance negatively. the lack of high-quality instructional resources is a critical barrier to improving educational outcomes and can exacerbate existing inequalities in education.

Another pressing issue is the inadequate maintenance and management of physical facilities, which affects the learning environment and overall school performance. Many public secondary schools struggle with poorly maintained infrastructure, including overcrowded classrooms, insufficient laboratory equipment, and inadequate recreational facilities. These conditions not only impede student engagement but also contribute to lower academic achievement. The World Bank (2023) emphasizes that subpar school infrastructure can directly affect student outcomes and limit the effectiveness of teaching and learning processes. Addressing these problems requires targeted investment and effective administrative practices to ensure that schools are equipped to provide a high-quality education. Based on this the study seek to examine the Quality Assurance Techniques and Administration of Public Secondary Schools in Bayelsa State

Purpose of the Study

The main purpose of the study is to examine quality assurance techniques and the administration of public secondary schools in Bayelsa State. Specifically, the study sought to;

1. Examine the relationship between the provision of instructional resources and the administration of public secondary schools in Bayelsa State.
2. Ascertain the relationship between availability of physical facilities and the administration of public secondary schools in Bayelsa State.
3. Establish the relationship between staff development and the administration of public secondary schools in Bayelsa State.

Research Questions

From the above specific objectives, the following research questions were formulated.

1. What is the relationship between provision of instructional resources and the administration of public secondary schools in Bayelsa State?
2. What is the relationship between availability of physical facilities and administration of public secondary schools in Bayelsa State?
3. What is the relationship between staff development and administration of public secondary schools in Bayelsa State?

Research Hypotheses

From the above research questions, the following null hypotheses are formulated.

1. There is no significant relationship between provision of instructional resources and the administration of public secondary schools in Bayelsa State.
2. There is no significant relationship between availability of physical facilities and administration of public secondary schools in Bayelsa State.
3. There no significant relationship between staff development and the administration of public secondary schools in Bayelsa State.

Methodology

This study adopted a correlation research design. The study was carried out in Bayelsa State. The population of this study consisted of 648 administrators (principals and vice principals) in 297 public secondary schools in Bayelsa State. The entire population of 648 administrators (principals and vice principals) in 297 public secondary schools in Bayelsa State was used as the sample size ecause the number appears to be small and manageable for the study. Thus, census sampling technique was employed in this study. A self-designed instrument titled 'Quality Assurance Techniques Questionnaire (QATQ) and Administration of Public Secondary School Questionnaire' (APSSQ), the questionnaire was structured on a 4-point Likert rating scale of Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1, in which a respondent is required to tick (√) his/her choice in the space provided for response to the statements in the questionnaire. To validate the instrument, the researcher adopted the face and content validity method. The instruments where validated by experts from the Department of Educational Management, Faculty of Education, Rivers State University. In order to establish the reliability of the instrument, the instrument was administered ten copies of QATQ and APSSQ to school administrators in Rivers State who were not part of the study. Their responses were analyzed using Cronbach Alpha method. The computation yielded reliability coefficients of 0.82, 0.78, 0.88, 0.79, 0.89, and 0.77for the various clusters of the instrument respectively. Data collected for this study were analyzed using Pearson Product Moment Correlation Coefficient (PPMCC) statistics.

Result

Research Question 1: What is the relationship between provision of instructional resources and administration of public secondary schools in Bayelsa State?

Table 1: Pearson Product Moment Correlation Analysis between Provision of Instructional Resources and Administration of Public Secondary Schools in Bayelsa State

Variables	N	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	$\sum XY$	r-cal	Remarks
Provision of Instruction Resource (X)	540	11692	284790			
				200373	+0.86	**High Positive**
Administration (Y)	540	8304	145758			

Source: Field Survey, 2024

Table 1 presents the summary of Pearson Product Moment Correlation Analysis between Provision of Instructional Resources and Administration of Public Secondary Schools in Bayelsa State. The result showed that the r-calculated value was 0.86, indicating a high positive relationship. The result implies that the relationship between the provision of instructional resources and administration of public secondary schools is strong and positive. R-cal value of 0.86 infers that when instructional resources are sufficiently provided in secondary schools there would be improvement in the administration of secondary schools in Bayelsa State.

Research Question 2: What is the relationship between availability of physical facilities and administration of public secondary schools in Bayelsa State?

Table 2: Pearson Product Moment Relationship Analysis between Availability of Physical Facilities and Administration of Public Secondary Schools in Bayelsa State

Variables	N	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	$\sum XY$	r-cal	Remarks
Availability of Physical Facilities (X)	540	9022	173888			
				156776	+0.88	**High Positive**
Administration (Y)	540	8304	145758			

Source: Field Survey, 2024

Table 2 presents the summary of Pearson Product Moment Correlation Analysis between availability of physical facilities and administration of public secondary schools in Bayelsa State. From the analysis, the r-calculated value is +0.88, indicating a high positive relationship. This value shows a high magnitude and positive direction of the relationship between availability of physical facilities and administration of public secondary schools in Bayelsa. The implication of this result is that availability of physical facilities leads to effective administration of secondary schools. In a reverse order, the finding could also be interpreted as unavailability of physical facilities results to ineffective administration in public secondary schools in Bayelsa State.

Research Question 3: What is the relationship between staff development and administration of public secondary schools in Bayelsa State?

Table 3: Pearson Product Moment Correlation Analysis between Staff Development and Administration of Public Secondary Schools in Bayelsa State

Variables	N	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	$\sum XY$	r-cal	Remarks
Staff Development (X)	540	6861	97781			
				117463	+0.86	High Positive
Administration (Y)	540	8304	145758			

Source: Field Survey, 2024

Table 3 revealed the summary of Pearson Product Moment Correlation analysis between Staff Development and Administration of Public Secondary Schools in Bayelsa State. According to the analysis, $\sum X$= 6861, $\sum Y$= 8304, $\sum X^2$=97781, $\sum Y^2$= 145758 and $\sum XY$=117463 which gave r-calculated value of +0.86. The r-cal value (+0.86) obtained implies that there is a high positive relationship between staff development and administration of public secondary schools in Bayelsa State. That is, as staff development index grows there is a corresponding improvement in school administration and vice versa.

Hypotheses

H$_{O1}$: There is no significant correlation between provision of instructional resources and the administration of public secondary schools in Bayelsa State.

Table 4: t-transformation Analysis of the Correlation between Provision of Instructional Resources and the Administration of Public Secondary Schools in Bayelsa State

Variables	N	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	α	r-cal	t-cal	tcrit	Rmks
Provision of Instructional Resources (X)	540	11692	284790					
				0.05	0.86	76.74	1.96	Sig. H_o
Administration (Y)	540	8304	145758					

Source: Field Survey, 2024

Table 4 displays the t-transformation analysis of the correlation between provision of instructional resources and the administration of public secondary schools in Bayelsa State. The analysis on the table revealed that the sum and sum of squares for provision of instructional resources are 11692 and 284790, whereas that of the independent variable (school administration) are 8304 and 145758 respectively. The correlation coefficient (0.86) when transformed to t-cal at 538 degrees of freedom under 0.05 level of significance is 86.13. Since the t-cal (76.72) is greater than t-critical (1.96), the null hypothesis was rejected. Thus, the null hypothesis of no significant relationship between provision of instructional material and administration in senior secondary schools in Bayelsa State is rejected. This implies that there is a significant positive relationship between provision of instructional resources and administration of public secondary schools in Bayelsa State.

H_{O2}: There is no significant correlation availability of physical facilities and administration of public secondary schools in Bayelsa State.

Table 5: t-transformation Analysis of the Correlation Between Availability of Physical Facilities and the Administration of Public Secondary Schools in Bayelsa State

Variables	N	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	A	r-cal	t-cal	tcrit	Rmk
Availability of Physical Facilities (X)	540	9022	173888					
				0.05	+0.88	88.73	1.96	Sig. H_o
Administration (Y)	540	8304	145758					

Source: Research Data Output, 2024

Table 5 shows the summary of t-transformation Analysis of the correlation between availability of physical facilities and the administration of public secondary schools in Bayelsa State. The analysis on the Table 4.8 showed that the sum and sum of squares for the independent variable (availability of physical facilities) are 9022 and 173888, whereas that of the dependent variable (school administration) 8304 and 145758 respectively. The relationship coefficient (0.88) when transformed to t-cal at 538 degrees of freedom under 0.05 level of significance is 88.73. Since the t-cal (88.73) is greater than t-critical (1.96), the null hypothesis was rejected. Thus, the null hypothesis of no significant relationship between availability of physical facilities and the administration of public secondary schools in Bayelsa State is rejected. This implies that the relationship between availability of physical facilities and the administration of public secondary schools is significant.

H_{O3}: There no significant correlation between staff development and the administration of public secondary schools in Bayelsa State.

Table 6: t-transformation Analysis of the Correlation between Staff Development and the Administration of Public Secondary Schools in Bayelsa State

Variables	N	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	A	r-cal	t-cal	tcrit	Rmk
Staff Development (X)	540	6917	99399	0.05	+0.86	76.72	1.96	Sig. H_o
Administration (Y)	540	8304	145758					

Source: Research Data Output, 2024

Table 6: revealed the t-transformation analysis of the correlation between staff development and the administration of public secondary schools in Bayelsa State. The analysis on the table 4.8 showed that the sum and sum of squares for the independent variable (staff development) are 6917 and 99399, whereas that of the dependent variable (school administration) 8304 and 145758 respectively. In the table, the r-cal value (0.86) was transformed to t-cal which gave 76.72. At 538 degrees of freedom under 0.05 level of significance, the t-critical obtained was 1.96. Comparing the t-cal (76.72) to t-crit (1.96), the t-cal is greater than the t-critical value, which means, the null hypothesis was rejected. Thus, the null hypothesis of no significant relationship between staff development and the administration of public secondary schools in Bayelsa State is rejected. This implies that the relationship between staff development and the administration of public secondary schools in Bayelsa State is significant.

Discussion of Findings

The findings of the study for research question one revealed that there is a high positive and significant relationship between provision of instructional materials and administration of public secondary schools in Bayelsa State. The corresponding hypothesis one also revealed that there is no significant correlation between provision of instructional resources and the administration of public secondary schools in Bayelsa State. The result reveals that the correlation r-calculated value was 0.86 which indicated a high positive relationship. The finding of this study aligns with Aladenusi and Oluwakemi (2018) who investigated the predictive power of some quality assurance indices (school climate, principals' leadership role, instructional supervision, availability and utilization of instructional resources) on teachers' job effectiveness in secondary schools.

The findings of the study for research question two revealed that there is a high and positive relationship between availability of physical facilities and administration in public secondary schools in Bayelsa State. The corresponding hypothesis also revealed that there is a significant relationship in availability of physical facilities and administration of public secondary schools in Bayelsa State. The result was established with a calculated r-value of 0.86. The finding infers that the more physical facilities are available in the school, the more effective school administration would be. This finding agrees with Nwite and Okpalanze (2023) who opined that the provision of infrastructural facilities, recruitment of qualified teachers, secondary school curriculum implementation and effective leadership management are quality assurance practices in secondary schools in Enugu State.

The findings of the study for research question three revealed that there is a high and positive relationship between staff development and administration in public secondary schools in Bayelsa. The corresponding hypothesis also revealed that there is a significant relationship between staff development and administration in public secondary schools in Bayelsa State.

The result reveals that the correlation coefficient r-calculated value was 0.86.This implies that as staff are being exposed to personal and professional development, there is significant improvement in school administration in Bayelsa State.

Conclusion

Based on the findings, of the study it was concluded that there is a significant relationship between Provision of Instructional Resources, Availability of Physical Facilities and Staff Development; Implying that a relationship exists between quality assurance techniques and administration of public secondary schools in Bayelsa State.

Recommendations

Based on the findings of the study, the following recommendations have been made;

1. School administrators should ensure that instructional materials are sufficiently provided for teachers to aid effective instructional delivery and achievement of educational goals and objectives this will help teachers increase their pedagogical skills and development for efficiency in instructional delivery
2. Government should avail physical facilities in public secondary in Bayelsa State and rehabilitate and maintain dilapidated and less physical facilities to avoid weakening the fortress for quality delivery in secondary school.
3. School principals should encourage and support staff development programmes among secondary school teachers as this would enable teachers to give priority to personal and professional development.

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Principals Financial Management Strategies for Effective Administration of Private Secondary Schools in Obalga and Phalga in Rivers State

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Abstract

The study investigated Principals Financial Management Strategies for Effective Administration of Private Secondary Schools in Obio/Akpor Local Government Area (OBALGA) and Port Harcourt Local Government Area (PHALGA) in Rivers State. The study adopted descriptive survey research design. The population of the study consisted of 767 principals in fully accredited private secondary schools in OBALGA and PHALGA in Rivers State. Four Objectives, four research question and four null hypotheses were formulated for the study. The sample size of the study was 230 principals drawn from the population of the study, which represent 30% of the entire population. Simple random sampling technique was used for the sample. The sample was gotten from fully accredited private secondary schools in OBALGA and PHALGA in Rivers State. OBALGA (140) PHALGA (90). A structured questionnaire by the researcher titled "Principals' Financial Management Strategies and Administration of Private Secondary Schools. (PFMSAPSSQ) was used to obtain responses from the respondents. The instrument was validated by three Experts, two from Business Education and one from Measurement and Evaluation all in the Faculty of Education Rivers State University. Reliability of the instrument was obtained using test re-test method. Sample was correlated using Pearson Product Moment Correlation (PPMC), and a reliability co-efficient index of 0.77 was obtained. Mean was used to analyze the data collected, while t-test was used to test the hypotheses at 0.05 level of significant. The findings revealed that. Principals of private secondary schools in OBALGA and PHALGA apply financial management strategies. The Researchers therefore recommended that Principals of private secondary schools should embark on training to acquire more knowledge on budgeting strategies for the process of deciding when, what, where and how to do certain activities in the administration of school financial management in OBALGA and PHALGA in Rivers State.

Keywords: *Principal, Financial, Management, Strategies and Administration*.

Introduction

Education is as old as man and this is because man has always found a means of increasing in knowledge since his existence. Thus no nation can advance beyond the level of its education. Education is therefore paramount to the growth and development of any nation and should be treated with utmost importance. The first secondary school in Nigeria was church missionary society grammar school founded in 1859 by T.B. Macauley in Lagos Nigeria. Many other secondary schools were established between 1859 and 1882 with little or no financial support from the colonial government (Ogbonnaya, 2012). Government acquired and opened more schools as the communities began to appreciate western education. By 1970, according to Ogbodo in Peretomode (2004), government acquired all primary and secondary schools from the voluntary agencies. Today we have two categories of secondary school in the country, public secondary schools which are owned and managed by the government through the Ministry of Education and private secondary schools which are owned by private individuals under the regulation and supervision of the ministry of education.

The first private secondary school was Eko Boys High School Lagos founded 13th January 1913 by Rev. William Benjamin Euba, a teacher and master of religion at the Methodist Boys High School, Lagos. It was with the greatest spirit and a desire to establish an African Institution that will provide educational opportunities for the less privilege citizens of Lagos that made Rev. Euba to establish this school.

The school started with 28 students at 30 Broad Street Lagos, next building to St. George's Hall, Lagos, opposite the Methodist Boys High School.

Financial management has been looked at as a very critical segment for the survival of any institution. This is because the growth and development of educational sector and any other establishment is dependent on how well its finances are managed. The finances for learning institutions are utilized for daily operations and activities of concern to the institutes. Financial management therefore, seeks to plan, organize, allocate, and control the resources of any organization; by ensuring that such resources whether financial or non-financial are used in the most efficient and effective way in order to achieve short-and long- term goals of the organization or institution.

Koko (2018) opined that the importance of maintaining an adequate monetary accountability in a business organization cannot be overemphasized. The principle of accountability dictates that individuals must be responsible for any monetary transactions entrusted to them within a given period. This task involves taking care of working capital (recurrent and capital costs) and other sundry expenses.

Gulick and Urwick in Koko (2018) highlighted in their seven principles of administration the importance of budgeting as an act of effective financial management. Budgeting involves consideration of five basic elements, vis-à-vis; what was, what is, what ought to be, and what is achieved. This exercise enables the Principal to examine previous practices and experience with what is available in order to project the future. This (previous accounting period budget estimates) with Principal is able to project current budget based on expectations for the period. Financial management is one of the means to examine the accomplishment or not of the budget provisions. Invariably, every manager or principal is expected to account for any monies given as working capital at the end of a specified period through keeping basic account books. Thus, it has been recommended that to effectively accomplish this important management accounting as a tool for decision-making, essentially, the principal will need to keep daily records of all financial transactions in the office through the maintenance of petty cash book, income and expenditure account, the cash book, profit and loss accounts and the balance sheet. According to Fung (2015), the rationale for financial management is raising funds for both short-term and long-term use and enhancing proper utilization of the fund. According to Kalu (2011), financial management in organizations firms and institutions had been a sensitive issue over the years. This is because the government and the public are interested on how funds are planned, controlled, and applied for specific assignment to achieve set objectives. In educational institutions, the realization of desired educational goals and objectives depend largely on the efficient planning and management of school funds by the school administrators.

Every organization is operated by a group of people but headed by one person at a time, academic institution inclusive. Secondary schools whether private or public is headed by the Principal on whom the responsibilities of the school rests on. The Principal is saddened with the responsibility of managing the finances of the school. The Principal is expected to source for funds for daily running of the school, he is expected to increase the sources of the school's income by generating more avenue to generate revenue other than that made available to him. Some of this revenue can be generated from school magazines, workshops, school poultry and farms, school canteen, sales of student's art and crafts, PTA contributions among others. The school Principal has the responsibility of ensuring that school funds are not wasted or misappropriated.

Oche (2019) referred to the Principal as the executive head of a secondary school and is responsible for coordinating all school activities ranging from students enrolment, planning of the school time table, keeping of school records like the class registers, book keeping log book, visitor's books updating staff with information from the ministry of education instructing the students making budgetary and fiscal plans, sourcing for funds to run the school and managing the funds made available to run the school, with the aim of realizing educational goals and objectives.

Financial Management and Accounting: Koko (2018**)** stated that from time to time, managers (Principals) request for funds to meet the immediate need of the office or to provide services to its day to day running of the school activities. This request must be followed with a record of previous financial showing accountability. All previous income and expenditure are clearly recorded to get a clear picture of the financial trend and to guide decision making. Sometimes, shareholders may request for revenue accruing to the school declared as profit and loss account to enable decisions concerning government tax, dividend or profit sharing. All this information is provided by adequate financial accounting.

Principals' Responsibilities as Financial Managers

- Planning
- Investment and spending of money
- Financing and raising of funds
- Maximizing the value of the firm, organization or school through the impact of long-term decision making of financial managers or principals of schools.

The principals stand to exhibit or display the following as good financial managers:

a. Manage all the financial resources of the school.
b. Keep the school functional.
c. Proper utilization of funds.
d. Maintain balance between risks and profitability of the school.
e. Facilitates cost control.
f. Involved in analytical or strategic thinking for school growth.
g. Co-ordinates all processes for effectiveness, efficiency and profitability.

System Management Theory was propounded by Austria Biologist Ludwig Von Bertalaffy first publication (1950). This theory postulates that an organization is a social system made up of interdependent parts. The system was seen as a series of interrelated and interdependent parts in such a way that the interaction of any part of the system affects the whole system. That is, one part of the system must interact and depend on the other parts around it to function efficiently. The system theory is important to education system because education is a system and the concept of interaction and interdependence of parts with the education system like all other social systems has selfsame properties. The theory is of utmost help to this research work as the principals reflects in the objectives, functions and the ultimate goal of the educational system in which they operate with the other system analysis methods and systematic thinking which allow the system to interact effectively and efficiently for maximal productivity or profitability to sustain continuity.

Acheck (2015) examined the Motivational Strategies of Principals in the management of selected secondary Schools in Fako Divisions of the Southwest Region of Cameroon. The study was guided with three research objectives and three research questions. The descriptive survey design was used to select data from a representative sample of the population using questionnaires for teachers and principals. The data was analyzed using means and standard deviation and presented on tables and histogram. The findings revealed that motivational strategies of principals include those related to empathetic, supportive, caring and just on academic and disciplinary matters, positive leadership good behavior and transformational leadership style. This was explained by the aggregate mean score of 3293243 on a scale of 1 to 4. The findings revealed that motivation is significant in the teaching and learning process is positively related to the teaching/learning process (3.572973). Finally, the economic state of the nation, the character of the school and administrator, school physical environment, political image of the nation, school location and the financial status of the school; in order are the factors that influence staff motivation in secondary schools.

Acheck concluded that problem of secondary schools is not teacher motivation by principals, but is due to other factors like; up-grade of teachers' salaries by government since after the 1990s global economic meltdown. There is therefore a need for government to revisit the salary situation of teachers among other factors. This study is related to the study under review because it examined Motivational Strategies of Principals in the management of schools.

Agwuma (2020) examined the Principals' Financial Management Strategies for Effective Administration of Public Secondary Schools in Orashi Region of Rivers State. The study was guided with four research objectives and four research questions. Descriptive survey design was used for the study, area of the study consisted of Abua/Odual, Ogba/Egbema/Ndoni, Ahoada East and Ahoada West Local Government Areas of Rivers State, the population of the study was 136 principals, (PIPFMAPSS) was used as self-structured questionnaires for data collection, mean and standard deviation was used to answer the questions while z-test was used to test the hypothesis at 0.05level of significance. The findings revealed that adequate record keeping procedures help in accountability, demanding for strict adherence to budget plans is one thing but scrutinizing the efficacy and prudence of income and expenditures is another thing. Agwuma concluded that proper budgeting, planning, putting effective control mechanism, checks and balance are good strategies for management of public secondary schools in Orashi Region.

Akpan (2008) revealed that in ensuring accountability in financial management, Principals should regularly cross check and monitor school accounts, insist on collection of receipt of purchase from staff, keep ledger accounts of all maintenance costs. All these practices are commendable and will minimize the incidence of financial mismanagement in private secondary schools in Rivers State. This study is related to the study under review because it examined Principals' financial Management Strategies and Administration of Public Secondary Schools in Orashi Region of Rivers State, while the study under review is Principals' Financial Management Strategies for Effective Administration of Private Secondary Schools in OBALGA and PHALGA in Rivers State.

Strategy

The term strategy is derived from the Greek word "strategos" and is defined as a general method or policy for achieving specific objectives (Thom-Otuya & Ubulomin Amesi & Obi 2020). These specific objectives are geared towards achieving a goal. In the same vein, Ugwuanyi (2012) asserted that strategy is a wide basic plan of action by which individual(s) or organizations(s) intend to reach their goals.

Strategic management is defined as the process of evaluation, planning, and implementation designed to maintain or improve competitive advantage. The process of evaluation is concerned with assessment of the external and internal environments of business. Planning involves developing business models, corporate direction, competitive tactics, international strategy, acquisitions, and collaborative action. The implementation phase requires leadership to build the appropriate organizational structure, develop management culture, control the strategic processes, and steer the organization through ethical corporate governance. The outcomes of strategic activity are visible in the change in revenues, market shares, profits, and return on investment for stakeholders. The outcomes create a feedback loop which in turn affects the external and internal environment of the organization.

Planning

Concept of planning is based on the theory of "thinking before acting". Planning is an integral part of our life; we make plans in each and every step of our life whether it be to go to school or buy household goods during shopping. We make plans according to the limitations of our budget and resources to get maximum satisfaction and to fulfill goals from our activities.

Planning is the process of deciding when, what, where and how to do a certain activity before starting to work. Various types of plans are operational, tactical and strategic plan, formal and informal plan, proactive plan and functional and corporative plan. The planning process comprises – Analysis of the environment, setting the objective, formulation of the derivative plan, Budget formulation, implementation of the plan and follow up action.

Budget and Budgeting

Many authorities in business sectors and in educational institution have defined budget in many ways. For instance, Kalu, (2011) defined budget as a financial statement, prepared in advanced at the opening of a fiscal year of the estimated revenue and proposed expenditure of the organization for the ensuring year. This suggests that the budget is a financial plan, summing the financial experience of the past, stating a current plan and projecting it over a specific period in the future. It is a forecast and of revenue and expenditure for a stated period which explains in details institutional fiscal policies and its corresponding annual plan.

Cash Management Strategies

Peter and Sunday (2015) opined that in many industries, both debt and equity funding remain difficult to access. This creates a serious challenge for companies that require cash to remain competitive, maintain financial flexibility and pursue potential growth opportunities. While market trends change and customer preferences shift, one thing is immutable: cash remains king. Companies primarily focused on accessing that financing externally, however, may be overlooking a large, hidden source of capital: their own balance sheets. To be sure, accessing that cash requires organization-wide financial discipline and a clear working capital optimization strategy. On some level, most companies understand this. However, understanding is not the same as actively implementing strategies for improving your cash flow. If you don't have a formal working capital strategy, have not adopted appropriate drivers and metrics, or simply have not communicated clear policies across the organization, you may be missing out on opportunities to hit your free-cash targets, reduce costs, increase shareholder returns and fund growth. While there are numerous ways to free up working capital, this series focuses on four core strategies: accounts receivable, accounts payable, inventory and cash management. This third installment looks at cash management.

Building a Cash Management Culture

Accounts receivable, accounts payable and inventory are all components of working capital that companies can streamline to access cash trapped on their balance sheets. When approached holistically, however, proper management of your accounts receivable, accounts payable and inventory all fall under the umbrella of effective cash management. To improve any of these levers, companies must create a cash management culture. For senior management, this means going beyond prioritizing cash flows in an effort to free up cash. It means encouraging financial and cash flow discipline in both good and more difficult economic times. Depending on a company's goals, financial discipline can translate into different initiatives. These may include the adoption of more prudent investing criteria or a leaner cost structure. Either way, a focus on financial discipline including integrated financial and cash flow forecasting generally allows companies to strengthen their balance sheet improve financial stability and can lead to greater profitability. As a result, your company gains the control and flexibility.

The Principal and Accountability in Secondary School

The role a principal play is regarded primary as that of a head teacher who keep thing in good order, discipline students, submit reports, perform whatever clerical as necessary and keep track of students' record. All these are aim at achieving the goal for which the principal is to be held accountable (Oche 2009). The principal cannot make policy statement without interference. His performance is being subjected to increasing criticisms by parents and other stake holders who see the management of the school as not just the responsibility of the principal alone but a collective responsibility of the entire community. The principal has to realize the commonality of interest he shares with those from the ministry education and other stake holders therefore the principal is to provide himself with the management skills for the increasing demand for accountability to government, community, students and other constituencies.

According to Tafida (2015), accountability include setting current goal evaluating the degree of achievement and at what price, presenting and interpreting the information to the public, and accepting responsibility for any result that are perceived as adequate. According Adesina (2017), is largely a legal concept define by recommended or required procedures in record keeping and financial transaction. It also requires procedure for reviewing and discipline individual who tends to violate professional ethics and standard. It involves an audit to ascertain whether resources have been used for specified purpose according to practices or requirement. Principal, who are appointed outside merit or due to political consideration, may not possess the management expertise and experience needed for efficient and effective school management (Udoh et al., 1997).

According to Ogbonnaya (2015),financial control is defined by Financial Training Centre (FTC) 2005 as a branch of management which enables expenditure to be kept in check under the will and decision of the controlling body, and the inflow of revenue to be constantly under review in view of the analysis made so far financial controlling is an established device to promote checks and balances in organizational finance management and there are specified principles, rules and regulations laid down by the supervisory body to ensure the desired control.

Statement of the Problem

Education is an instrument for national development. It is also a cornerstone of a nation's culture and an absolute necessity for economic development. There is hardly any household in this nation that is not concerned about the state of our educational system, particularly the secondary education. The role of a Principal is to strategically direct the affairs of secondary school system. Principals' ought to develop standardized strategic planning, strategic record keeping, cash management strategies, capital budgeting strategies, revise policies and procedure, monitor student's achievement, encourage parent involvement, hire and evaluate staff and oversee facilities. However, the revise is the case as the structure for effective administration of private secondary schools is in a deplorable condition. Teachers are demoralized and disenchanted as the secondary school's system now produces millions of virtually illiterate young people or secondary school leavers who roam the streets in search of employment that is not available (Sofoluwe, 2012). Additionally, this evidence of decline also relates to financial dryness in administration, inadequate planning, quality training of principals, and mismanagement of funds and lack of internal auditors. Hence there is a great concern on how the decline can be controlled so as to meet the needs of the students and also laying a solid foundation for the private secondary schools' education in OBALGA and PHALGA in Rivers State.

It is against this back dropped that the researcher wants to examine whether principals of private secondary schools in OBALGA and PHALGA apply financial management strategies to produce millions of literate young secondary school leavers who can gainfully be employed in the society.

Purpose of the Study

The purpose of the study is to determine whether Principals apply financial management strategies for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State. Specifically, the study intended to:

1. Determine whether Principals apply financial strategic planning for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State.
2. Determine whether Principals apply financial strategic record keeping for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State.
3. Determine whether Principals apply capital budgeting strategies for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State.
4. Determine whether Principals apply cash management strategies for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State.

Research Questions

The following research questions guided the study:

1. Do Principals apply financial strategic planning for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State?
2. Do Principals apply financial strategic record keeping for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State?
3. Do Principals apply capital budgeting strategies for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State?
4. Do Principals apply cash management strategies for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State?

Hypotheses

1. Principals in OBALGA do not significantly differ from those in PHALGA on the application of financial strategic planning in the administration of private secondary schools.
2. Principals in OBALGA do not significantly differ from those in PHALGA on the application of financial strategic record keeping in the administration of private secondary schools.
3. Principals in OBALGA do not significantly differ from those in PHALGA on the application of financial capital budgeting strategies in the administration of private secondary schools.
4. Principals in OBALGA do not significantly differ from those in PHALGA on the application of financial cash management strategies in the administration of private secondary schools.

Methodology

The study investigated whether Principals apply financial management strategies for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State. The descriptive survey research design was adopted for the study. The population of the study consisted of 767 Principals in fully accredited private secondary schools in OBALGA and PHALGA in Rivers State. The sample size of the study was 230 Principals, which represent 30% of the entire population. Simple random sampling technique was used for sampling and a sample size of 140 Principals for OBALGA and 90 Principals for PHALGA. A structured questionnaire titled "Principals Financial Management Strategies and Administration of Private Secondary Schools (PFMSAPSSQ) was used to obtain responses from the respondents. The Questionnaire was made up of 25 items, structured on a 4-point rating scale of Strongly Agreed (SA, 4), Agreed (A, 3) Disagreed (D, 2) Strongly Disagreed (SD, 1). The instrument was validated by three Experts, two from the Business Education and one from Measurement and Evaluation all in the Faculty of Education Rivers State University. Reliability of the instrument was obtained using test re-test method. Thus, 30 copies of the instrument were administered to 30 Principals twice in fully accredited private secondary schools in Ikwerre Local Government Area of Rivers State. After two weeks the first and second scores of the sample was correlated using Pearson Product Moment Correlation (PPMC), and a reliability co-efficient index of 0.77was obtained. The instrument was administered to the respondents accordingly, a total of 230 copies of questionnaire were produced and administered using two trained research assistants. The Instruction about the filling of the questionnaire was carefully given to the respondents and copies were collected immediately. Mean was used to analyze the data collected, while t-test was used to test the hypotheses at 0.05 level of significant. The decision was that the null hypotheses were rejected if t-calculated is greater than the t-critical value. Then the null hypotheses were accepted if the t-calculated is less than t-critical value.

Results

Research Question 1: Do Principals apply financial strategic planning for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State?

Table 1: Mean on Principals Application of Financial Strategic Planning for Effective Administration of Private Secondary Schools in OBALGA and PHALGA in Rivers State N = 230

S/N		Local Government Areas OBALGA (n=140) $\bar{X}$	Remarks	PHALGA (n=90) $\bar{X}$	Remarks
	Principals application of financial strategic planning				
1	Finance planning improves professionalism amongst finance officers.	2.86	Agreed	3.28	Agreed
2	Finance planning enhance financial transparency.	3.14	Agreed	3.44	Agreed
3	Finance strategies enhance financial prudency.	3.07	Agreed	3.33	Agreed
4	Planning for periodic budgeting is a good financial strategy to be used by school principals.	3.18	Agreed	3.33	Agreed
5	Finance planning helps in the realization of public sector.	2.10	Disagreed	3.33	Agreed
6	Finance strategies by principal enhance accountability.	3.25	Agreed	3.32	Agreed
	Total Mean	**17.6**		**20.03**	
	Grand Mean	**2.93**		**3.37**	

Source: Field Survey 2024

Table 1 above shows that the mean of all the responses that are above 2.50 are at the agreeable region and there are no items that scored below 2.50. Thus, it could be ascertained from the responses that Principals apply strategic planning in the effective administration of private secondary schools in OBALGA and PHALGA in Rivers State.

Research Question 2: Do Principals apply financial strategic record keeping for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State?

Table 2: Mean on Principals Application of Strategic Record-Keeping for Effective Administration of Private Secondary Schools in OBALGA and PHALGA in Rivers State. N = 230

S/N	Item	Local Government Areas OBALGA (n=140) $\bar{X}$	Remarks	PHALGA (n=90) $\bar{X}$	Remarks
	Principals application of strategic record keeping				
7	Record-keeping enhance internal/external financial decision making.	3.19	Agreed	3.55	Strongly Agree
8	Record-keeping enhance strategic financial effectiveness.	3.11	Agreed	3.38	Agreed
9	Record-keeping improves financial records in an organization.	3.21	Agreed	3.22	Agreed
10	Record-keeping enhance professional performance.	3.02	Agreed	3.31	Agreed

11	Record-keeping enhances the effectiveness of financial officers.	3.21	Agreed	3.20	Agreed
12	Record-keeping enhance prudence in the management of finances in an organization.	3.03	Agreed	3.33	Agreed
13	Record-keeping enhance accountability.	3.21		3.26	Agreed
	Total Mean	**21.98**		**23.25**	
	Grand Mean	**3.14**		**3.32**	

Source: Field Survey 2024

Table 2 shows that the mean of all the responses are all above 2.50 are at the acceptance region and there are no items that scored below 2.50. Thus, it could be ascertained from the responses that Principals apply strategic record-keeping in the administration of private secondary schools in OBALGA and PHALGA in Rivers State.

Research Question 3: Do Principals apply capital budgeting strategies for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State?

Table 3: **Mean on Principals Application of Capital Budgeting Strategies for Effective Administration of Private Secondary Schools in OBALGA and PHALGA Rivers State? N=230**

		Local Government Areas			
S/N	**Item**	**OBALGA (n=140) $\bar{X}$**	**Remarks**	**PHALGA (n=90) $\bar{X}$**	**Remarks**
	Principals application of capital budgeting strategies				
14	Principals updating budget assumption	3.03	Agreed	3.05	Agreed
15	Principals adheres to budget guidelines in executing projects	2.74	Agreed	3.17	Agreed
16	Principals need more knowledge on capital budgeting	3.07	Agreed	3.14	Agreed
17	Principals should be trained more on budgeting	2.86	Agreed	3.28	Agreed
18	Principals obtaining budget approval	2.96	Agreed	3.33	Agreed
19	Principals apply budget guideline	2.93	Agreed	3.28	Agreed
20	Principals issuing the budget	3.14		3.39	Agreed
	Total Mean	**20.73**		**22.64**	
	Grand Mean	**2.96**		**3.23**	

Source: Field Survey 2024

Table 3 shows that the mean of all the responses are above 2.50 and at the agree region and there are no items that scored below 2.50 and grand mean is 2.96 and 3.23. Thus, it could be ascertained from the responses that Principals need more knowledge and more training on capital budgeting in Private Secondary Schools in OBALGA and PHALGA in Rivers State.

Research Question 4: Do Principals apply cash management strategies for effective administration of private secondary schools in OBALGA and PHALGA in Rivers State?

Table 4: Mean on Principals Application of Cash Management Strategies for Effective Administration of Private Secondary Schools in OBALGA and PHALGA Rivers State **N=230**

		Local Government Areas			
S/N	**Item**	**OBALGA (n=140) $\bar{X}$**	**Remarks**	**PHALGA (n=90) $\bar{X}$**	**Remarks**
	Principals application on Cash Management Strategies				
21	Cash management strategies improve the management of public finance.	3.11	Agreed	3.37	Agreed
22	Cash management strategies enhance quality financial service delivery.	3.06	Agreed	3.22	Agreed
23	Cash management strategies promote financial transparency.	2.96	Agreed	3.27	Agreed
24	Cash management strategies enhance the attainment of organizational financial goals.	2.86	Agreed	3.28	Agreed
25	Cash management strategies speeds up financial record management.	2.78	Agreed	3.16	Agreed
	Total Mean	**14.77**		**16.30**	
	Grand Mean	**2.95**		**3.26**	

Source: Field Survey 2024

Table four shows that the mean of all the responses that are above 2.50 are at the acceptance region and there are no items that scored below 2.50. Thus, it could be ascertained from the responses in item 21, 22, 23, 24, and 25 that principals apply cash management strategies in the administration Private Secondary Schools in OBALGA and PHALGA in Rivers State.

Hypotheses 1: Principals in OBALGA do not significantly differ from those in PHALGA on the application of financial strategic planning in the administration of private secondary schools.

Table 5: t-test Analysis on Principals Application of Financial Strategic Planning for Effective Administration of Private Secondary Schools in OBALGA and PHALGA in Rivers State

Principals of Private Secondary Schools	**N**	**Mean**	**df**	**t-cal**	**t-crit**	**Level of sig.**	**Decision**
OBALGA	140	2.93					
			228	-4.56	1.96	0.05	Accepted
PHALGA	90	3.37					
Total	**230**	**6.3**					

Source: Field Survey 2024

t-calculated value of -4.56 is less than the t-critical value of 1.96 at 0.05 level of significance and DF of 228. Thus, we cannot reject the null hypothesis because there is no significant difference in the mean responses between OBALGA Principals and PHALGA principals in the administration of Financial Strategic Planning in Private Secondary Schools in OBALGA and PHALGA in Rivers State.

Hypotheses 2: Principals in OBALGA do not significantly differ from those in PHALGA on the application of financial strategic planning in the administration of private secondary schools.

Table 6: t-test Analysis on Principals Application of Financial Strategic Planning for Effective Administration of Private Secondary Schools in OBALGA and PHALGA in Rivers State

Principals of Private Secondary Schools	N	Mean	df	t-cal	t-crit	Level of sig.	Decision
OBALGA	140	3.14					
			228	-1.73	1.96	0.05	Accepted
PHALGA	90	3.32					
Total	**230**	**6.26**					

Source: Field Survey 2024

t-calculated value of -1.73 is less than the t-critical value of 1.96at0.05 level of significance and DF of 228. Thus, we cannot reject the null hypothesis because there is no significant difference in the mean responses between OBALGA Principals and PHALGA principals in the administration of Financial Strategic record-keeping in Private Secondary Schools in OBALGA and PHALGA in Rivers State

Hypotheses 3: Principals in OBALGA do not significantly differ from those in PHALGA on the application of capital budgeting strategies for effective administration of private secondary schools.

Table 7: t-test Analysis on Principals Application of Capital Budgeting Strategies for Effective Administration of Private Secondary Schools in OBALGA and PHALGA Rivers State

Principals of Private Secondary Schools	N	Mean	Df	t-cal	t-crit	Level of sig.	Decision
OBALGA	140	2.96					
			228	-1.24	1.96	0.05	Accepted
PHALGA	90	3.23					
Total	**230**	**6.19**					

Source: Field Survey 2024

t-calculated value of -1.24 is less than the t-critical value of 1.96at0.05 level of significance and DF of 228. Thus, we cannot reject the null hypothesis because there is no significant difference in the mean responses between OBALGA Principals and PHALGA principals in the administration on capital budgeting strategies in Private Secondary Schools in OBALGA and PHALGA in Rivers State'

Hypotheses 4: Principals in OBALGA do not significantly differ from those in PHALGA on the application of cash management strategies for effective administration of private secondary schools.

Table 8: t-test Analysis on Principals Application of Cash Management Strategies for Effective Administration of Private Secondary Schools in OBALGA and PHALGA Rivers State

Principals of Private Secondary Schools	N	Mean	df	t-cal	t-crit	Level of sig.	Decision
OBALGA	140	2.95					
			228	-3.44	1.96	0.05	Accepted
PHALGA	90	3.26					
Total	**230**	**6.21**					

Source: Field Survey 2024

t-calculated value of -3.44 is less than the t-critical value of 1.96 at 0.05 level of significance and DF of 228. Thus, we cannot reject the null hypothesis because there is no significant difference in the mean responses between OBALGA Principals and PHALGA principals in the administration of Finance on cash management strategies in Private Secondary Schools in OBALGA and PHALGA in Rivers State

Discussion of Findings

Findings from the research question one indicates that the respondents considered principals application of financial strategic planning to improve: professionalism amongst officers, enhance financial transparency, prudency, periodic budgeting, realization of public sector needs, and financial accountability. Gurlic and Urwick in Koko (2018) posited that budgeting is an act of effective financial management. The exercise enables the Principals to examine previous practical and experience with what is available in order to project the future. Koko (2018) also opined that principles of accountability dictate that individuals must be responsible for any monetary transactions entrusted to them within a given period of time. The finding is in agreement with the views of Kalu (2011), Fung (2015) and Oche (2019). These scholars opined that government and the public are interested in how funds are planned, controlled and applied for specific assignment to achieve set objectives. Thus, institutions or firms desire to achieve set objectives. Thus, institutions or firms desire achievement of educational goals and set objectives; depend largely on the efficient planning and management of school funds by the school administrators (Principals). Because every organization is operated by a group of people but headed by one person at a time (academic institutions inclusive). The result of the hypothesis one proved that there is no significance in the mean responses between principal or private secondary schools in the administration of financial strategic planning in OBALGA and PHALGA in Rivers State. This means that financial management seeks to plan, organize, allocate and control the resources of organizations; by ensuring that such resources whether financial or non-financial are used in the most efficient and effective way in order to achieve short-term and long-term goals of the organizations or schools.

Findings from research question two proved that respondents considered record keeping to enhance: internal and external financial decision making, financial effectiveness, professional performance, prudence in the management of finances in an organization and accountability of principals' strategies for effective management of school finances. These findings were in agreement with the views of Peter and Sunday (2015), Ugwuachi (2012) who revealed that debt and equity funding remain difficult to access. Thus, it creates serious challenges for companies or organizations that require cash to remain competitive, flexible and also pursue potential growth opportunities because market trend charges and customers' preferences do shift with time. However, Thom-Otuya, Ubulom, Amesi and Obi (2020) posited that strategy is a general method or policy for achieving specific objectives geared toward achieving a goal. Therefore, the process of deciding when, what, where and how to do certain activities before the main task of operations are carried out in an organization or institution of learning the principals of private secondary schools in OBALGA and PHALGA in Rivers State. The result of hypothesis two tested indicates that there is no significant difference between the mean responses of OBALGA and PHALGA principals on how principals effectively manage school finances. Thus, adequate cognitive practice or professional exposures of principals administrative and management application of strategic record-keeping in administration of schools in OBALGA and PHALGA in Rivers State.

Findings from research question three proved that the respondents considered principals' application of capital budgeting through updating budget assumptions, guidelines in executing projects, knowledge on capital budgeting and budge approval for projects. Kalu (2011), Tafida (2015) and Adesina (2017) opined that recommended procedures in record keeping and financial transactions are required for accountability and transparency sake in an organization or institution. It is also a required procedure for reviewing and discipline individuals who financial transactions who tends to violate professional ethics and standard in an organization or institution of learning. In agreement with Agivums (2020) who revealed that adequate record keeping help to enhance accountability, demand for strict adherence to budget plans, scrutinizing the efficacy and prudence of income and expenditure. Proper budgeting, planning, putting effective control mechanism, checks and balances are good strategies for management or public secondary schools in Rivers State. The results of hypothesis three tested indicates that there is no significant difference in the responses of principals in OBALGA and PHALGA administration of capital budgeting strategies in private secondary schools. A look at the findings of this study indicated that efforts ought to be intensified in the provision of adequate budget to principals to attract qualified, administrative and management inclined principals for effective and efficient resource allocation for profitability in the institutions.

The findings from research question four showed that the respondents considered principals' application of cash management strategies through: cash management to improve management of public finance, enhance quality financial service delivery, promote financial transparency, attainment of organizational goals and speed up financial record management. All these shows the extent to which principals applied cash management strategies in various private schools in OBALGA and PHALGA. The findings were in agreement with Peter and Sunday (2015) who opined that debt and equity funding remained difficult to access. It also creates serious challenges for companies that require cash to remain competitive, maintain financial flexibility and pursue potential growth opportunities. However, organizations and institutions focused on internal and external sources of funds and their balance sheets to ensure financial discipline and working capital optimization. Thus, adoption of more prudent investment criteria or a less costly structure and integration of financial cash flow to strengthen organizational or institutional balance sheets, improve financial stability and increase profitability. The results on hypothesis four tested indicates that there is no significant difference in the mean responses between principals in the administration of finance and cash management strategies in private secondary schools in OBALGA and PHALGA in Rivers State.

Conclusion

Based on the findings of this study, the researchers concluded that principals of private secondary schools in OBALGA and PHALGA apply financial management strategies, strategic planning, and strategic record keeping in the administration of private secondary schools in Rivers Sate. Principals need more knowledge on capital budgeting.

Recommendations

Principals of private secondary schools should embark on training to acquire more knowledge on budgeting strategies for the process of deciding when, what, where and how to do certain activities in the administration of school financial management in OBALGA and PHALGA in Rivers State.

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Digital Electronic Record Systems and Administrative Efficiency of the Civil Service in Delta State, Nigeria

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Abstract

Digital electronic record systems are information technology applications designed to store and manage data and other documents on a paperless platform. The purpose of this study is to examine the relationship between digital/electronic record systems and administrative efficiency of the civil service in Delta State, Nigeria. The study adopted the conceptual approach in investigating the relationship between the variables of the study. First, the researcher reviewed the independent variable of the study (digital record system) and dependent variable (administrative efficiency) as well as the measures of dependent variable which comprises of timely decision, efficient workflow and workforce wellbeing. The parameter of the review was basically to ascertain the relationship that exists between digital record system and administrative efficiency with main focus on measures of the dependent variables. The result of the analytical review of the study showed that, there is a significant relationship between digital record system and administrative efficiency with strong indication pointed at timely decision, efficient workflow and workforce wellbeing.

***Keywords**: Digital Record System, Administrative Efficiency, Timely Decision, Efficient Workflow and Workforce Wellbeing.*

Introduction

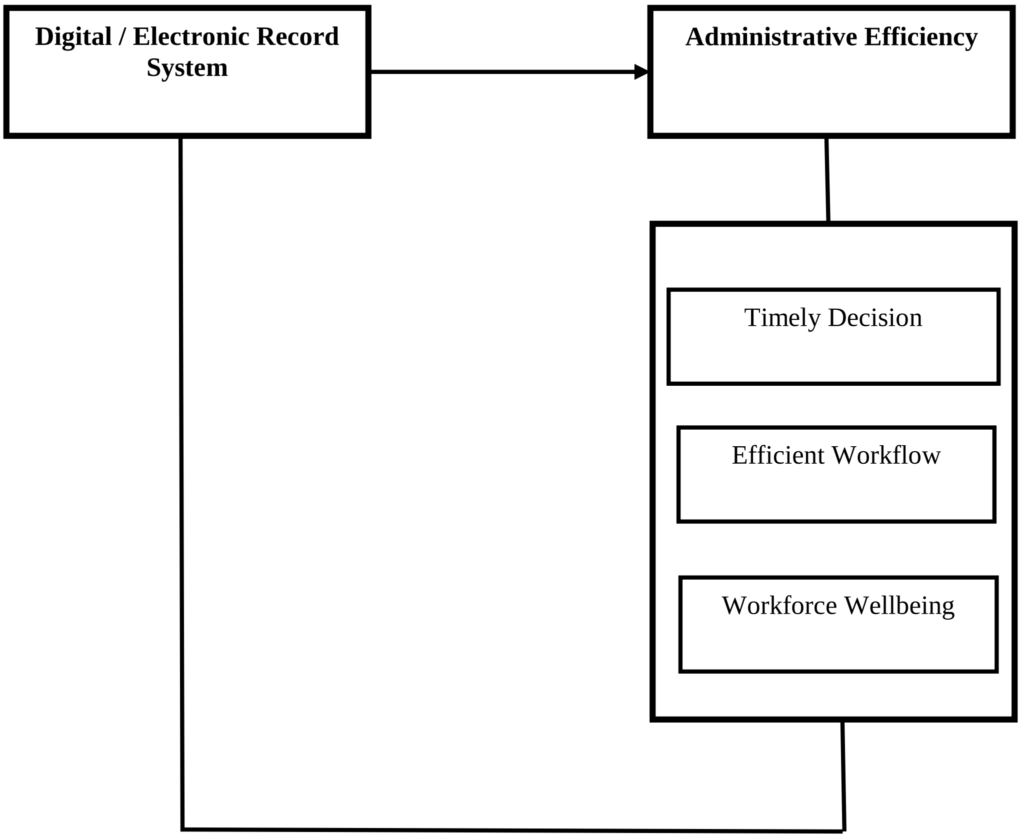
The proliferations of data and other related documents in the civil service sector today in Delta State, Nigeria continues to threaten the administrative unit. In the past, data and document in the public organization was domiciled in the filing cabinet and other paper based system. Fortunately, we are in a digital era and everything within organizations today either government or private are run and managed electronically. Administrative efficiency is a common concept used on a daily basis by all economic agents. However, the most acceptable definition of it is by Wikipedia (2021) and it says that it is the ability of the administrator to achieve the goals and objectives of the organization. Lean Six Sigma says it is a process improvement approach that uses a collaborative team effort to improve performance by systematically removing operational waste and reducing process variation. It combines Lean Management and six Sigma to increase the velocity of value creation in business processes/ It went ahead to say that it is a team-focused managerial approach that seeks to improve performance by eliminating resource waste and defects. Total Quality Management (TQM) is the continual process of detecting defects and reducing or eliminating errors in manufacturing. Business Process Re-engineering (BPR) is the radical redesign of business processes to achieve drastic improvements in performance, efficiency and effectiveness. ISO 9001 is defined as the international standard that specifies requirement system (QMS). Organizations use the standard to demonstrate the ability to consistently provide products and services that meet customer ad regulatory requirements. ISO 9001 is a globally recognized standard for quality management.

It helps organizations of all sizes and sectors to improve their performance meet customer expectations and demonstrate their commitment to quality. European Foundation for Quality Management (EFQM) mission is to empower organizations to achieve lasting impact, build a more sustainable future, and deliver meaningful benefits for all stakeholders. It has nine criteria that relate to key areas of organization, including leadership, strategy, people, partnerships and resources, processes, products and services, and various types of results. Nonetheless, there is still a common reference point by all users of the concept. It is used mainly in reference to governmental actions that are geared to serve the interest and ensure the well-being of the citizenry through proper management of both human and material resources. Therefore, administrative efficiency is the key to positive administrative changes (Armstrong & Bulmer, 2018). Administrative efficiency is the judicious utilization of agency's resources, proper conduct and management of governmental affairs at any government level to facilitate administrative effectiveness (Irfan, 2017).

Importantly, records and information play a critical role in fighting corruption, protecting citizen's rights, in ensuring transparency and good public sector services as well as governance. As such, there is need for government agency to recognize sound records management system as one of the priority areas. In spite of their significance, studies by the International Records Management Trust (IRMT 2019) among others suggest that record keeping systems in Africa generally have either collapsed or are in a state of disarray. Poor record keeping systems as argued by the Internal Record Management Trust (IRMT) and the World Bank has led to corrupt practices and lack of accountability and poor governance structures as well as weak decision making time. There are numerous studies on corruption and of accountability governments in Africa and how that has impacted negatively on socio-economic development of the citizenry. We have seen in Nigeria recently were very prominent citizens including a minister, public enterprises chief executives, lawyers and top civil servants have been prosecuted for corruption and economic crimes. These emanated from poor records keeping in the public sector.

The introduction of information and communication technology and the utilization of this tool in the administrative processes of Nigeria civil service sector was a sign of great relief with the believe that services of the sector will attain efficiency. The digital or electronic record system is a product of the information and communication technology. The main purpose is to ensure that official document in public institutions and organizations are stored and managed on a completely paperless platform. However, years after government spent huge sum of money on the acquisition and the development of the electronic system for records management, the public sector continues to struggle between going paperless completely. Therefore, the purpose of this study is to examine the relationship between digital or electronic record system and administrative efficiency of civil service sector in Delta State, Nigeria. In Delta State, the government introduced the digital electronic system in 2010 and as at date, they using the websites, emails, digital purchase receipts, word/excel documents and text messages. There are continuously training and retraining the public servants in the use of these electronic record systems.

Fig. 1: Conceptual Framework for Digital/Electronic Record System and Administrative Efficiency.



Source: Research, 2024

Literature Review

Theoretical Foundation

This study is based on the Diffusion of Innovation Theory, propounded by Rogers in 1962. Rogers' diffusion of innovation theory explained the involvement in the adoption of digital technologies and innovations in organizations. The theory also opined that all individuals and organizations will not adopt new or improved technologies at the same or point at which innovation are adopted will influence performance and efficiency. The two main assumptions of this theory are as follows: in a social system, there will always be a disparity in the level and time at which individuals and organizations within will adopt new ideas, techniques, and technology. The theory also explains and postulates that organizations that adopt innovations early will naturally outperform late adopters and the laggards. The implication of the first assumption is that no matter the level of digital infrastructures and digital training provided in an organization, not all the workers/management will accept and adapt to going digital. Thus, there will be obvious difference or gap in the level at which governments in Delta State accept this new digitalization, such as digital electronic record system. The second assumption is useful for explaining and predicting the interaction between workplace digitalization and administrative efficiency in government agencies. The justification for this theory as one of the theoretical pillars of this study is predicated on the fact that in a digitalized workplace, governments that quickly adopt digital record system will outperform their colleagues who for one or more reasons, slowly embrace the system or fail to implement it.

Digital Electronic Record System

Electronic record system is a digital database or software application designed to store, manage, and retrieve electronic records or information. The application replaces traditional paper-based record-keeping, enabling organizations to efficiently organize, access, and secure electronic data management and retrieval processes.

In today's fast growing digital era, organizations are creating, storing, and using more electronic records, and the systems used to create and manage these records are increasingly being integrated with each other. Until the early 1990s most records management related activities continued to be performed by capturing records to the end of the records life cycle in paper format. Paper records were classified for retention, packed for storage in boxes, and tracked with bar code labels placed on physical document or file folder. This is still a major method of records storage today. However, organizations relaxed that it was far more desirable to work directly with the electronic records management activities into electronic document management systems became critical to the implementation of well-planned information management systems. As organizations become increasingly automated, administrative business processes use of digital files and data became predominant in information processing. Organizations announced that prolific electronic records are considered as official records and tend to make new retention and disposition schedules for electronic records. In the early to mid-1990s, electronic records systems software integration occurred. Contemporary common software applications that are frequently used in offices can do exchange data; create graphics, and information content between different types of software packages. Most of these applications have been able to directly exchange and content so that an office worker with these applications can create sophisticated and integrated informative electronic documents.

The application of electronic record systems enables information to be accessed and presented at any time; especially those related to the various decisions within the institution, in addition to clarifying the procedures that help achieve fair job processes (Fawzy, 2003). According to Halawa and Nidaa (2013) electronic record system increases the credibility of the institutions that apply it, and it is also sufficient freedom for the beneficiary to obtain the required information about the institution, without blocking it under any circumstances, and all of this is done electronically.

Administrative Efficiency

The word administration is used all around us and in various ways. For example, the Oxford English Dictionary describes administration as follows: the process or activity of running a business, organization; etc. the management of public affairs, government the action dispensing, giving, or applying something. Over the decades, scholars have discussed the topic of efficiency along two major distinctions; also, it has always been subject to how the duties of government are defined. At one point in time, it was just to increase output; afterward, it was defined along pure business lines and later on, an element of value was added to cover the expectations of citizens as the most significant part of public goods and services. Schachter (2017) finds efficiency as an intrinsic value in public administration pointing out that its definition is debated among scholars of the field. Efficiency is the ability to do things well, successfully, and without waste. Efficiency has long played a central role in the terrain of public administration values and there is a growing demand that public organizations promote efficiency in the delivery of public goods and services to the citizens. Mihaiu, Opreana and Dritescu (2010) define efficiency as the relationship between the outcome effects, or output and the efforts made or input. Efficiency in this regard, can be achieved under the conditions of maximizing the results of an action in relation to the resources used, and it is calculated by comparing the effects obtained in their efforts. According to them, the outcome effects must be viewed not only in terms of economic but also in terms of social effects resulting from implementing a program.

Administrative efficiency is a common concept used on a daily basis by all economic agents. However, there is no precise and a universally acceptable definition of the term. It has a variety of meanings attached to it. Nonetheless, there is still a common reference point by all users of the concept. It is used mainly in reference to governmental actions that are geared to serve the interest and ensure the wellbeing of the citizenry through proper management of both human and material resources. Therefore, administrative efficiency is the key to positive administrative changes (Armstrong & Bulmer, 2018). Thus, administrative efficiency can be interpreted as the efficiency of the gathering, processing and communication of information (Jung, 2022).

Administrative efficiency connotes complying with due process, responsiveness to local needs, transparency, accountability and adhering to budget provisions (Longe & Durosaro, 2017). Administrative efficiency also looks at the systematic progress and well-organized administration (Payne & Pheysey, 1971 cited in Peter & Kavitha, 2020), they also posited that administrative efficiency in terms of the organizational structure, show how works are well organized and progress systematically and how information is gather, processed and communicated. For Marudas (2004) cited in Grizzle (2015), administrative efficiency is seen as program expenses, i.e., expenses for administrative purposes in relations to the total expenses. Administrative efficiency is the capacity of an organization, institution, or business to produce desired results with a minimum expenditure of energy, time, money, personnel, and material. Administrative efficiency is measured by looking at the extent to which work is well organized and progresses systematically. It is obvious therefore, that a result orient public sector in terms of delivering public services and improve value for public funds is the defining characteristic of administrative efficiency. Notably, most government in developing world has lack in efficient and effective administrative mechanisms to meet the citizens' demand.

Timely Decision

As time and day continues to move without waiting for no one, the efficiency of an organization depends mostly on the timely decision of the organizational leaders on matter affecting the future of the organization. Every decision has its own consequence, as such; decision making is a serious task that faces decision makers. Decision making is the process whereby an individual, group or organization reaches conclusions about what future actions to pursue given a set of objectives and limits on available resources. It is also the process of making choice out of alternatives choices. This process will be often iterative, involving issue-framing, intelligence-gathering, coming to conclusions and learning from experience. Timeliness reflects the ability of the organization to produce a response within an allotted time determined by the task requirements. Delays in completing a task are due both to the time required for processing information and making decisions and to the time required to effect communications among decision makers. Interestingly, organizations are formed when the task to be performed exceeds the capabilities of a single decision maker. Even when a single person can complete the task, he may not be able to produce a satisfactory response within the time limits imposed by the task. The organization designer is faced with the problem of designing an organization that will meet these design specifications and in addition, assign subtasks or functions to members of the organization so that no one is overloaded. The design has to be robust to accommodate the different decision making styles of different actual decision makers that may instantiate the organization at different times.

Efficient Workflow

Efficient workflow is concern with providing clearly defined tasks; prioritize automated support for business processes. Typically, an efficient workflow involves both people and software applications. Work is assigned to participants based on explicit resource allocation directives, which may link into an organizational database, and the timing is driven by an explicit representation of the temporal order of the various activities of the business process. Digital electronic record system is part of business information technology field that deals with controlling flows of digital record in both complex and small organizations. Workflow management in its most complete form includes a broad spectrum of aspects. The most import of these aspects are: routing of work objects (e.g. documents) through an organization as described by detailed route specifications. This includes the selection of alternative paths on 'splits' allocation of tasks in the workflow to actors (organizational workers) in the organization. The allocation can be based on actor functions, roles, workload and authorizations. Scheduling of tasks to be performed in time, dealing with workload of actors, prioritization of tasks, and availability of required resources. Scheduling includes alerting actors when tasks are to be performed. Scheduling of scarce resources like meeting rooms specialized equipment, based on resource availability usage per task, and task priorities. Monitoring the flow of work for management and alerting when attention is needed. Handling exceptional situations like missed deadlines or missing actors using exception definitions and general business rules. It may be clear that this long list of aspects causes a workflow management system dealing with all of this to be very complex.

Efficient workflow supports business processes by taking on their information logistics, which they ensure that the right information reaches the right person at the right time. Apart from the obvious fact that there is potential for savings in terms of time and money, there are other benefits in deploying electronic record system in the flow of administrative services in the public sector organization. by having explicit representations of these resource and control-flow dependencies, it can be claimed that changing workflows is easier and hence a business that has automated its processes by means of a digital technology may be more responsive to changes in its environment, such as changing old administrative processes in saving organization digital data and the flow of efficient service delivery. Efficient service delivery is the hallmark of every public sector administrator and any tool that can enable the achievement of this goal becomes necessary for good public sector development.

Workforce Wellbeing

The success of every organization depend on it workforce. Without the workforce, the objective of the organization cannot be met. Hence, the wellbeing of the organization workforce must be taking seriously. Workforce wellbeing is a psychological concept that defined the happiness and positive feelings of organization employees. The use of digital electronic system in organization workforce reduces workload and enabling effective service delivery. There is this popular adage that, a happy employee is a productive employee. This is t say that, when employee s psychologically motivated positively, the employees perform at their best. Fortunately, the developing world is now, to a large extent driven by the knowledge economy, where an increasing number of jobs focus on technology and information production requiring employees with specialized skill sets, making individuals difficult to replace (Hellgren, Sverke, & Naswall, 2018). Supporting and retaining employees is therefore important for organizational success.

A civil servant spends one quarter of their adult life at work, and for many work a key life pursuit. Feeling good and functioning well at work are therefore key components of a person's overall wellbeing. Experiencing a high level of wellbeing is associated with a range of positive organizational attitudes. These include superior work performance (Lyubomirsky, King, & Diener, 20015), low turnover intentions, low actual turnover (Boehem & Lyubomirsky 2018), greater effort and thought put into work, less absenteeism and fewer work related injuries (Keyes & Grzywaez, 2015). Given that work affects wellbeing, and that wellbeing is important for organizational success, it is in an organization's interests to support and promote workforce wellbeing at work (Dewe & Copper, 2012; Hone, Jarden, Ducan & Schofield, 2015).

Wellbeing has been defined according to two main but distinct perspectives. According to the hedonic perspective, wellbeing is described as happiness (Ryan & Deci, 2011). This perspective emphasizes the importance of three components: life satisfaction, the presence of positive mood, and the absence of negative mood (Diener, Sapyta, & Suh, 2018). The second, eudaemonist perspective, wellbeing is described in terms of self-actualization, proposing that true happiness is found in expressing virtue (Dewe & Cooper, 2012). The eudaemonist perspective views engagement in activities which foster human growth, such as autonomy, personal growth, self-acceptance, life purpose, mastery, and positive relatedness, as essential to wellbeing (Ryff & Keyes, 2015). The present study draws on research which proposes that a combination of both perspectives is more accurate, as workforce wellbeing can be viewed as a multidimensional phenomenon that encompasses both eudemonic and hedonic aspects (Fisher, 2014). In the present study, wellbeing is conceptualized as the combination of feeling good (hedonism) and functioning well (eudemonia) (Aked, Marks, Cordon, & Thompson, 2019). Wellbeing at work refers to a subjective perception of general satisfaction with and positive feelings toward work. It has also been suggested that conceptualizations of wellbeing at work and in general should include a component of social relationships, as this is a key component of an individual's positive experiences at work (Fisher, 2014). Looking at the both perspective and scholar's perception on the concept of wellbeing in this research study, we defined workforce wellbeing as psychological feelings of good, happiness, functioning well and the social relationship experienced at work that create employee satisfaction.

Conclusion

The core aim of administrators in today's organization is to ensure the desired results of the organization are achieved with minimum expenditure, time, money and other materials and above all the workforce. As administrative unit of the organization continues to seek ways that the organization can prosper and achieved maximum results with minimum resources, electronic record system offered that solution by enhancing administrative processes in record management and data storage while providing administrators with timely decision making, efficient workflow and workforce wellbeing. This was validated by the review of the study variables and relying on the results of the study's observations, we therefore, conclude that, there is a significant positive relationship between digital electronic record system and administrative efficiency of civil service in Delta State, Nigeria.

Suggestions

The following suggestions were made:

1. The government, agencies, corporations, institutions, etc. should enforce electronic digital systems with proper managerial staff management.
2. The government and all agencies should prioritize electronic communication systems to be functional in all ramifications
3. Government agencies should be practical in training in all staff that is responsible in the management in information technology management.

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STRATEGIES FOR DEVELOPING ACCOUNTING TEACHERS FOR EFFICIENT SUBJECT MATTER DELIVERY IN PUBLIC SECONDARY SCHOOLS IN PORT HARCOURT METROPOLIS

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Abstract
This study examined the strategies for developing Accounting teachers for efficient subject matter delivery in public secondary schools in Port Harcourt Metropolis. Three objectives, research questions and three hypotheses guided the study. The study adopted descriptive survey research design. The population of the study comprised 56 accounting teachers in Port Harcourt Metropolis. Based on the small population of the study, the entire population was used as the sample size for the study. A self-structured questionnaire titled "strategies for developing accounting teachers for efficient subject matter delivery in public secondary schools" was used as the instrument for data collection. The instrument was validated by three experts, two from Business Education Department and one from Measurement and Evaluation Department. The reliability of the instrument was established with test-retest method and a reliability coefficient of 0.92 was established which shows the instrument is reliable for the study. The data collected was analyzed with mean and standard deviation while t-test was used to test the hypotheses formulated in the study. Findings in the study show that the trainings gotten by accounting teachers enhance their creativity, productive and professionalism. Collaboration amongst accounting teachers depends on their understanding and enhances collective attainment of the goals of the subject and mentoring of accounting teachers enhance their career development, pedagogical skills and enhances their level of professionalism. Based on the findings the researcher recommended that accounting teachers in secondary schools should be engaged in efficient on-the-job training, accounting teachers should collaborate more to enhance their subject matter delivery in secondary schools, and effective mentoring should be provided for accounting teachers in secondary schools to enhance their effectiveness
.

Keywords: *Strategies, Accounting, Efficient Subject Matter, Teachers, Delivery*

Introduction
Secondary school education in Nigeria is that form of education received by children after primary education and before tertiary level with the broad aim of preparing them for useful living within the society and preparation for higher education. This level of education is a very fundamental stage in the life of the students because it gives them a firm foundation on which they can opt for a job and be self-reliant or proceed to higher institutions of learning for further studies. Against this background of National aspirations, the National Policy on Education commonly referred to as '6-3-3-4' system of education emerged which led to the introduction of vocational subjects, accounting, taught at the secondary schools in Nigeria.

Accounting is defined as the recording, classifying, creating, summarizing and communicating of financial information to interested parties and interpreting it to help in making specific business decisions (Longe, 2021). Accounting records are kept to calculate the performance and profitability of business organizations, prevent fraud, monitoring of the progress of the organization and as well as making economic decisions. The purpose of Accounting is to ensure that learners are able to acquire the following competencies of record, analyze and interpret financial data in order to make informed decisions; present and/or communicate financial information effectively by using generally accepted Accounting practice in line with current legislation. Others are ability to relate skills, knowledge and values to real-world situation to ensure balance between theory and practice and enter the work-place and/or move to higher education:

organize and manage own finances and activities responsibly and effectively. Also, apply principles to solve problems; develop critical, logical and analytical abilities and thought processes and apply these skills to new situations develop ethical behavior, sound judgment, thoroughness, orderliness, accuracy and neatness; and deal confidently with the demands of an Accounting occupation. Asaolu (2020) defined financial accounting as the process of recording, classifying, selecting, measuring, interpreting, summarizing and reporting financial data of an organization to the users for objective assessment and decision making.

According to Osisioma in Egbunike (2019), Accounting is seen as the process through a system of principles and techniques for recording, interpretation and communication of financial information as an aid to managerial decision making. Egbunike (2019) also reemphasized that accounting as the development of information for external decision makers such as banks, shareholders, trade unions, suppliers and government regulatory agencies. Accounting is operationally defined in this study as identification, classification, recording and summarize business transactions in order to allow managers, investors and creditors measure and evaluate the activities of an entity. Accounting as a subject is designed in the senior secondary school curriculum to equip students with the skills needed to carry out financial activities.

The Accounting curriculum in secondary schools was carefully designed to suit the needs of the students and other interested learners. When this subject is properly inculcated in the students, they will be properly grounded and prepared to become professionally accountant's tomorrow. Accounting in the globe today plays significant role in the growth and advancement of several organizations due to the detailed, thorough and orderly arrangement of financial records to ease understanding and interpretation to any person or the management of any organization where financial records are involved. Irrespective of these roles and advantages of accounting in the globe, the capacity and ability of the resource persons (teachers) to impact the concepts of this subject to the learners (students) also matters a lot because quality teaching of the subject is a very important factor that enhances students' ability to understand the concepts in this subject. This can be achieved through quality teaching of the subjects and the professional development of the teachers.

Teachers' development are planned organizational activities that are aimed at improving and increasing teachers' skill, knowledge, concept attitudes and behaviors to enable them meet the demands of the teaching job (Akpan, 2019). It focuses on improving the conceptual skill, intellectual and abilities needed to do a better job. Teachers' professional development programmes are associated with the general improvement of teachers in terms of behaviour, attitudes, skills, knowledge and perception in the performance of their duties. The immediate aim of staff development is to improve the performance of those with management responsibilities in order to improve the teaching and learning processes. These can be achieved by exposing them to mentoring, in-service training such as induction programmes, ICT training, workshops, conferences, seminars and courses as well as encouraging them to embark on active learning and collaboration to enhance quality teaching in secondary school subjects especially in financial accounting.

Teachers' development is the way teachers learn, that is how they learn and how they apply their knowledge in their teaching in order to facilitate the learning of their students (learners) (Avalos, 2017). Professional development includes the following, on-the-job training, active learning, mentoring, teachers' collaboration, workshop, seminar and continuing education programmes (Mohammed, 2019). Instructional delivery is also enhanced through professional development of accounting teachers. This professional development is concerned with the transferring or impacting of course content and skills in teachers that are necessary for effective delivery of instruction in the classroom. For instructional delivery to be effective, the following professional development can be adopted; on-the-job training, collaboration, mentoring, workshops, refresher courses, seminars, study circle, project groups, correspondence courses and field trips (Fazalur, 2021).

On-the-job training is any training acquired during employment and undertaken to engage in such training is usually part of the appointment agreement between the employer and employee. In-service training for teachers therefore is a training process that goes throughout the working life of a teacher.

As he does not finish learning upon graduation, that is how teachers' training helps in improving teachers' skills and knowledge over time. On-the-job training is the upgrading of knowledge and skills of employees, the modeling and re-orientation of their attitude so that they can be more effective, efficient and productive in the performance of their job (Egonmwan, 2018). This development becomes necessary because no worker is completely perfect at the time of hiring. They need to be developed right from the time they come into service, during their services, career and to the point of separation from the service (Egonmwan, 2018).

It is directed towards the improvement of teachers and this focuses on areas where their skills are inadequate. It is also for the purpose of upgrading and bridging the gap with much interest to provide the needed creativity and flexibility in academic activities. In-service training brings about curriculum change, innovation in teaching methodologies and provision of quality professional growth and development. It focuses on developing and manifesting quality performance by use of modern aids, interesting skills or knowledge in respect of teaching subject (Broadwell, 2019). It creates an avenue for individuals to work as a team in solving problems which are of common concern to all staff as well as contributing to the development of the educational objectives of the school system so as to encourage growth and performance (Abarikannda, 2018).

On-the-job training of teachers is basically to upgrade and update the potentiality and competency of teachers to become supportive, participative and achievement oriented. It is focused on changing individual values, orientation and attitude towards the learning environment. It enhances performances as it provides access to professional growth which helps to reduce some deficiencies in skills and methodologies in teaching (Abarikannda, 2018). It creates opportunities for teachers to consistently rise in their individual transmission of knowledge thereby achieving the goal of a subject, bringing innovation in the curriculum, promoting a high degree of participation in decision-making as well as standard of teaching (Abarikannda, 2018).

However, on-the-job training is of various forms such as; workshops, seminars, conference, study circle, lectures, demonstrations, project group, panel presentation and field trip (Abarikannda, 2018). There are several techniques schools can deploy in providing training for teachers. Some of these techniques are listed and discussed as follows: Workshops: This is a period of discussion and practical work on a particular topic or subject, where group of teachers share their knowledge and experience. In doing this, members of the workshop discuss and exchange views on certain issue. Usually, workshops have durations of between three to ten days depending on the gravity of the problem: In seminar, small group of teachers meet to discuss a topic and each participant has the opportunity to gain knowledge and experience: A conference is a meeting for discussion or exchange of views. Usually, the conference of teachers, principals, supervisors, and administrators can broaden their professional horizons and cultivate in the participants a professional team spirit.

Study Circle is a method where teachers of a particular subject meet to discuss the ways and means of teaching that particular subject to enhance their job efficient and performance.

Lecture are oral activities, the simplest ways practiced for in-service education and teachers' re-orientation programmes, they are suitable particularly for transmission of knowledge.

Demonstration is an activity pre-arranged for the observation of a group of teachers; the demonstrator is usually a skillful expert of the field being demonstrated. Efforts should be made to make the demonstration genuine and natural, so that artificiality could be avoided. Demonstration may be used for workshop or any other course of study where knowledge and skills are being improved. After the demonstration, a follow up should be made.

Project Group: This is used in those occasions where the accomplishment of a specific project is to be carried out. This project group usually makes survey of the project assignment and develops a course of study.

Panel Presentation: A panel is a technique in which two or more persons speak on a single topic. It can be of any of the following types; debate, symposium, and informal panel.

Film: Presentation of films is also a very useful technique of in-service training. An ideal film presentation is when it is associated with discussion.

Due to the rapid growth of knowledge as well as the technological, social and cultural revolution of our time, it has become generally agreed by educationist that initial teachers' preparation is totally inadequate for continued success in teaching. Wayne & Young (2020) found that promoting teachers' quality through in-service education is a key element in improving productivity among teachers in both primary and secondary schools. The above point was further strengthened by Stewart & Hart (2019), when they postulated that through in-service training, teachers become responsible for their effectiveness and they therefore become more sensitive, insightful, open to more options and less frightened to innovations and changes.

Photanan (2020) asserted that on-the-job training is the most important tool that can be used as motivational program for teachers' development. It therefore gives motivation to teachers for their performance enhancement. In the view of Oribhabor (2020), on-the-job training aids the development of competences such as technical, conception, and managerial skills for the furtherance of individuals and organizational growth. Similarly, Quartey (2022) contended that, the more workers are trained and are satisfied with their job and environmental conditions, the more they help enhance their organizations' performance. A sizeable body of research examined the effect of in-service training on teachers' job effectiveness, productivity in performance. Cohn, Buhalis, & Peters (2018) opined that organizations that train their workers reduce turnover rate. Huang (2021) noted that, in-service training can be powerful driving force for institution's expansion as well as building capabilities and subsequently productivity.

In exploring the impact of on-the-job training on institution's growth, Jones (2020) confirmed that increasing training efforts increases workers' job effectiveness and performance and of course the institution's efficiency. In his appreciation of in-service training education Corey (2019) asserted that planned programme of in-service education are essential for adequate professional improvement of school personnel. He acknowledged that promoting teacher quality through on-the-job education is a key element in improving productivity among teachers in both primary and secondary education. The above point indicates that through on-the-job training in education, the teacher becomes responsible for his own growth and effectiveness, and is therefore, more sensitive, insight-full, open to more options and less frightened to innovation and change.

Similarly, Goidhaber and Brewer (2020) posited that the major goal of on-the-job training in the educational sector is the continuous improvement of the teachers' performance, effectiveness and efficiently in classroom related activities. Clotfelter, Ladd & Vigdor (2018) and Freg (2019) provided evidence that better trained and more experienced teachers tend to get students of greater ability and with fewer discipline problems. On-the-job training is an important factor that contributes to improve performance of the teachers and therefore increase academic performance of students. Cottrell (2020) added that through on-the-job training the teachers benefited in the areas of acquisition of new knowledge, development of new skills, improved competencies and enhance motivation, all when added together under a learning environment ensure improved academic performance of students.

Teachers' professional collaboration as an aspect of professional development also plays significant role in the teaching of financial accounting in secondary schools. Collaboration is defined as a situation in which two or more people learn or attempt to learn something new. This is referred to as professional collaboration or collaborative learning. Collaborative learning is often linked to professional cooperative learning. The idea behind collaborative learning involves two or more individuals working together to accomplish a task or produce a product in a particular way (Gunter, Estes & Schwad, 2019).

Collaboration helps teachers to remain focused on the shared vision and mission of the learning community (Williams, 2018). William asserted that consistent collaboration on professional practices results in reflective thinking, improved instructional strategies and students' achievement. Therefore, collaboration helps to build trust in relationship and promotes a positive learning environment and positive learning environment has a positive influence in student achievement and enhances the learning of both teachers and students (William, 2018). When teachers have opportunities to collaborate professionally, they build upon their distinctive experiences, pedagogies and content (Goddard, 2019).

Collaborative learning facilitates intrinsic learning from participants and builds their ability to achieve the set objectives of a programme or preplanned structure (Williams, 2018). Collaborative learning model for teachers fostered problem solving through the deepening of the understanding of both the content and the students, aligns strategies with students' need and content goals, implementing strategies with students and then reflect on their effectiveness, collaborating and planning lesson and assessments (Brodesky, Gross, Tigueand and Palmers, 2020). Collaborating learning amongst teachers promotes social interdependence and positive goal attainment which enhances productivity, intrinsic motivation to achieve reward or avoid loss of reward, facilitates the development of various perspectives and creative reasoning (Johnson & Johnson, 2019). Collaborative learning amongst teachers also helps teachers to have a sense of shared responsibility. That is, when teachers collaborate with one another, they share experiences and innovate strategies; during collaborative discussions, teachers are given a voice in curricular implementation and variety of skills to support students' learning needs (Williams, 2018).

Mentoring of teachers as part of teachers' professional development is very paramount due to the experiences that mentors have over the years. Teacher's mentorship can be defined as "helping novices speed up the learning of a new job or skill and reduce the stress of transition, improving instructional performance of novices through modeling by a top performer and socializing novices into the profession of teaching (Walker, 2019). Mentorship is the special relationship that is cultivated between a mentor and protégée whereby the mentor counsels, guides and helps the protégée to develop both personally and professionally (Garet, Porter, Desimone, Birman and Yoon, 2019). The purpose of mentoring efforts ranged from orientation and induction of new teachers to instructional improvement with the intent to change the culture of the school to a more collaborative learning environment (Poden and Denmark, 2020). The qualifications and experience of teachers affect the quality of their teaching. Linked to this idea is the importance of mentoring first-time teachers (Amoor, 2019).

Statement of the Problem

The introduction of Accounting as a subject at the senior secondary level of education is to help in educating the learners on basic Accounting concepts that they ought to know. Accounting aimed at equipping students with the necessary knowledge needed for them to function effectively as individuals and also make basic financial decisions on their own. It is also a tool for preparing students to go into careers that are related to finance and management in the future and other qualifications as well. Despite the great impact of accounting subject in secondary schools, the teachers' professional development is of great importance. It has been observed that a lot of accounting teachers in secondary schools need to be professionally developed to teach the subject very well. The non-development of these teachers will affect their ability to effectively deliver the contents in the subject thereby affecting the performance of the students as a whole. When an Accounting teacher is not properly developed, it goes a long way in affecting the ability of the teacher to deliver the contents of the subject efficiently. It is on this ground that this study seeks to determine the strategies such as on-the-job training, collaborative and mentoring for developing accounting teachers for efficient subject matter delivery in public secondary schools in Rivers State.

Purpose of the Study

The purpose of this study was to determine the strategies for developing accounting teachers for efficient subject matter delivery in public secondary schools in Port Harcourt Metropolis. Specifically, the study sought to:

1. Determine the extent to which on-the-job training of accounting teachers in public secondary schools can enhance efficient subject matter delivery in Port Harcourt Metropolis.
2. Determine the extent to which professional collaboration of accounting teachers in public secondary schools can enhance efficient subject matter delivery in Port Harcourt Metropolis.
3. Determine the extent to which mentoring of accounting teachers in public secondary schools can enhance efficient subject matter delivery in Port Harcourt Metropolis.

Research Questions

The following research questions were raised to guide the study:

1. To what extent can on-the-job training of accounting teachers in public secondary schools enhance efficient subject matter delivery in Port Harcourt Metropolis.?
2. To what extent can collaboration of accounting teachers in public secondary schools enhance efficient subject matter delivery in Port Harcourt Metropolis?
3. To what extent can mentoring of accounting teachers in public secondary schools enhance efficient subject matter delivery in Port Harcourt Metropolis?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean ratings of male and female accounting teachers in public secondary school on the extent to which on-the-job training enhances the subject matter delivery of accounting teachers in secondary schools in Port Harcourt Metropolis.
2. There is no significant difference in the mean ratings of male and female accounting teachers in public secondary school on the extent to which collaboration enhances the subject matter delivery of accounting teachers in secondary schools in Port Harcourt Metropolis.
3. There is no significant difference in the mean ratings of male and female accounting teachers in public secondary school on the extent to which mentoring enhances the subject matter delivery of accounting teachers in secondary schools in Port Harcourt Metropolis.

Methodology

A descriptive survey research design was adopted for the study. The population of the study consisted of 56 (16 males and 40 females) accounting teachers in 38 secondary schools in Port-Harcourt metropolis. Three objectives, three research questions and three hypotheses guided the study. The entire population was used for the study since the population was manageable. The data for the study was collected with a self-structured questionnaire titled: “Strategies for Developing Accounting Teachers for Efficient Subject Matter Delivery Questionnaire”. The questionnaire was validated by three experts (one in Measurement and Evaluation, and two in Business Education) in the Faculty of Education, Rivers State University, Port-Harcourt. Pearson Product Moment Correlation coefficient was used to test the reliability of the instrument and a reliability coefficient index of 0.92 was obtained. All the 56 copies of questionnaire that were distributed to the respondents were retrieved and used for the study. Mean and standard deviation statistical tool were used to analyze the research questions while t-test was used to test the hypotheses at 0.05 level of significance. Since the study adopted a 4-point rating scale, the decision rule for the analysis was made based on; if the t-calculated value is greater than the t-critical value; reject the null hypotheses and conclude significant difference. Accept the null hypotheses and conclude no significant difference if the t-calculated value is less than the t-critical value. The analysis was made based on a mean cut off of 2.50; Very High Extent (VHE-3.50-4.00), High Extent (HE -2.50-3.49), Low Extent (LE-1.50-2.49), Very Low Extent (VLE-1.00-1.49).

Results

Research Question 1: To what extent can on-the-job training of accounting teachers in public secondary schools enhance efficient subject matter delivery in Rivers State?

Table 1: Data on the Extent to which On-The-Job Training of Accounting Teachers Enhances Efficient Subject Matter Delivery **N = 56**

S/N	ITEMS	Teachers (16)			Teachers (40)			Aggregate		
		$\bar{x}$	SD	RMK	$\bar{x}$	SD	RMK	$\bar{x}$	SD	RMK
1.	The trainings I have received on-the-job has helped me to teach financial accounting better	3.06	0.61	HE	2.88	0.58	HE	2.97	0.59	HE
2.	The trainings I have received on-the-job does not enhance my productivity as an accounting teacher	1.94	0.39S	LE	1.88	0.38	LE	1.91	0.38	LE
3.	On-the-job trainings that I have received as an accounting teacher has enhanced my creativity as an accounting teacher	3.44	0.69	HE	2.93	0.59	HE	3.19	0.64	HE
4.	The trainings that i receive on-the-job as an accounting teacher does not improve accounting curriculum.	1.75	0.35	LE	1.88	0.38	LSE	1.82	0.36	LE
5.	The trainings that I have received on-the-job as an accounting teacher has enhanced my professional development	3.00	0.60	HE	3.00	0.60	HE	3.00	0.60	HE
	Total Mean/SD	**13.19**	**3.18**		**12.57**	**2.53**		**12.89**	**2.57**	
	Grand Mean/SD	**2.64**	**0.53**	**HE**	**2.51**	**0.51**	**HE**	**2.58**	**0.51**	**HE**

Source: Field Survey, 2024

The analysis in Table one shows that the male and female accounting teachers opined that on-the-job training helps them to teach financial accounting better, enhance their creativity and professional development at a high extent as indicated in the aggregate mean responses of 2.97,3.19 and 3.00. The respondents also opined that on-the-job training does enhance their productivity and improves curriculum as indicated in the aggregate mean responses of 1.91 and 1.82 which are at low extent. However, the aggregate grand mean was 2.58 indicating a high extent to which on-the-job training of accounting teachers in public secondary schools enhances efficient subject matter delivery in Rivers State.

Research Question 2: To what extent does collaboration of accounting teachers in public secondary schools enhance efficient subject matter delivery in Rivers State?

Table 2: Data on the Extent Collaboration of Accounting Teachers enhance efficient subject matter delivery in Rivers State **N = 56**

S/N	ITEMS	Teachers (16)			Teachers (40)			Aggregate		
		$\bar{x}$	SD	RMK	$\bar{x}$	SD	RMK	$\bar{x}$	SD	RMK
6	Collaborating with fellow accounting teachers has enhanced collective achievement of goals in the subject.	2.81	0.56	HE	2.80	0.56	HE	2.80	0.56	HE

7	Collaborating with other accounting teachers does not deepen my understanding of the subject contents	2.06	0.41	LE	1.98	0.39	LE	2.02	0.40	LE
8	Collaborating with other accounting teachers enhances my productivity in the subject.	2.88	0.68	HE	2.67	0.52	HE	2.80	0.55	HE
9	Collaborating with colleagues does not create a sense of responsibility in me.	2.06	0.41	LE	1.90	0.38	LE	1.98	0.39	LE
10	Collaborating with others enables me to be innovative	2.88	0.58	HE	2.88	0.58	HE	2.88	0.58	HE
	Total Mean/SD	**12.69**	**2.64**		**12.16**	**2.43**		**12.49**	**2.85**	
	Grand Mean/SD	**2.54**	**0.53**	**HE**	**2.50**	**0.49**	**HE**	**2.52**	**0.49**	**HE**

Source: Field Survey, 2024

The analysis in Table two shows that the male and female accounting teachers opined that; collaboration enhances the collective achievement of subject matter goals, enhances productivity and innovation at a high extent as indicated in the aggregate mean responses of 2.80, 2.74, and 2.88. The respondents also opined that; Collaboration does not deepen their understanding and it creates a sense of professional responsibility as indicated in the aggregate mean responses of 2.02 and 1.98 which are at a low extent. However, the aggregate grand mean was 2.52 indicating a high extent to which collaboration of accounting teachers in public secondary schools enhances efficient subject matter delivery in Rivers State.

Research Question 3: To what extent does mentoring of accounting teachers in secondary schools enhance efficient subject matter delivery in Port Harcourt Metropolis.?

Table 3: Data on the Extent Mentoring of accounting teachers in secondary schools enhance efficient subject matter delivery **N = 56**

S/N	ITEMS	Teachers (16)			Teachers (40)			Aggregate		
		$\bar{x}$	SD	RMK	$\bar{x}$	SD	RMK	$\bar{x}$	SD	RMK
11	My career development has been enhanced through mentoring by more experienced accounting teachers	2.50	0.50	HE	2.25	0.45	LE	2.38	0.48	LE
12	Mentoring does not enhance my pedagogical skills as an accounting teacher	2.38	0.48	LE	1.95	0.39	LE	2.17	0.44	LE
13	Mentoring has enhanced my level of professionalism in the accounting profession.	2.88	0.58	HE	2.58	0.48	LE	2.73	0.53	HE
14	Mentoring has not improved my experience level as an accounting teacher.	2.10	0.42	LE	1.88	0.38	LE	1.99	0.40	LE
15	Mentoring has sharpened my skill in teaching accounting as a subject in secondary schools.	2.69	0.54	HE	2.65	0.51	HE	2.67	0.52	HE
	Total Mean/SD	**12.55**	**2.52**		**11.03**	**2.21**		**12.08**	**2.37**	
	Grand Mean/SD	**2.51**	**0.50**	**HE**	**2.49**	**0.44**	**LE**	**2.50**	**0.47**	**HE**

Source: Field Survey, 2024

The analysis in table three shows that most of the male and female accounting teachers opined that; mentoring helps professional development and sharpens the skills of teachers at a high extent as indicated in the aggregate mean responses of 2.64 and 2.63 respectively. The respondents also opined that mentoring enhances career development, pedagogical skills and improves teaching experience at a low extent as indicated aggregate mean responses of 2.38,2.17 and 1.99 respectively. However, the aggregate grand mean was 2.50 indicating a high extent to which collaboration of accounting teachers in public secondary schools enhances efficient subject matter delivery in Rivers State.

Hypotheses

Hypothesis 1: There is no significant difference in the mean ratings of male and female accounting teachers in secondary schools on the extent to which on-the-job training enhances their subject matter delivery in secondary schools in Rivers State.

Table 4: t-test of difference between Male and Female Accounting Teachers in Secondary Schools on the Extent On-The-Job Training Enhance their Subject Matter Delivery in Secondary Schools

Groups	N	$\bar{x}$	SD	Df	t-cal	t-crit	Level of Sign	Decision
Male Teachers	16	2.64	0.53	54	1.4	2.004	0.05	**Accepted**
Female Teachers	40	2.51	0.51					

Source: Field Survey, 2024

The analysis in Table 4 shows that t-calculated (1.4) is less than the t-critical (2.004). Hence, the hypothesis was accepted. Therefore, there is no significant difference in the mean ratings of male and female accounting teachers on the extent to which in-service training enhances quality of accounting in secondary Schools in Port Harcourt Metropolis.

Hypotheses 2: There is no significant difference in the mean ratings of male and female accounting teachers in secondary schools on the extent to which collaboration enhances their subject matter delivery in secondary schools in Rivers State.

Table 5: t-test of difference between Male and Female Accounting Teachers in Secondary Schools on The Extent to which Collaboration Enhances their Subject Matter Delivery in Secondary Schools

Groups	N	$\bar{x}$	SD	Df	t-cal	t-crit	Level of Sign	Decision
Male Teachers	16	2.54	0.53	54	0.69	2.004	0.05	**Accepted**
Female Teachers	40	2.43	0.49					

Source: Field Survey, 2024

The analysis in Table 5 shows that the t-calculated (0.69) is less than the t-critical (2.004). Hence, the hypothesis was accepted. Therefore, there is no significant difference in the mean ratings of male and female teachers on the extent to which teachers' collaboration enhances the quality teaching of accounting in secondary schools in Port Harcourt Metropolis.

Hypotheses 3: There is no significant difference in the mean ratings of male and female accounting teachers in secondary school on the extent mentoring enhances their subject matter delivery in secondary schools in Rivers State.

Table 6: t-test of Difference between Male and Female Accounting Teachers in Secondary School in the Extent Mentoring Enhances their Subject Matter Delivery in Secondary Schools.

Groups	N	$\bar{x}$	SD	Df	t-cal	t-crit	Level of Sign	Decision
Male Teachers	16	2.51	0.50	54	1.88	2.004	0.05	**Retained**
Female Teachers	40	2.21	0.44					

Source: Field Survey, 2023

The analysis in Table 6 shows that the t-calculated (1.88) is less than the t-critical (2.004). Hence, the hypothesis was accepted. Therefore, there is no significant difference in the mean ratings of male and female teachers on the extent mentoring of accounting teachers enhances the quality teaching of accounting in Port Harcourt metropolis.

Discussion of Findings

The researcher presented the discussion of findings as follows:
The findings in research question one with regards to extent to which on-the-job training of accounting teachers in public secondary schools can enhance efficient subject matter delivery in Port Harcourt metropolis showed that the responses were high, indicating a high extent to which on-the-job training of accounting teachers in public secondary schools enhances efficient subject matter delivery in Rivers State. This finding is in agreement with the view of Egonmwan, (2018) who stated that On-the-job training is the upgrading of knowledge and skills of employees, the modeling and re-orientation of their attitude so that they can be more effective, efficient and productive in the performance of their job. In agreement with the view of Egonmwan, Abarikannde, (2018) stated that It creates an avenue for individuals to work as a team in solving problems which are of common concern to all staff as well as contributing to the development of the educational objectives of the school system so as to encourage growth and performance. In agreement with the views of Egonmwan, Abarikannde Broadwell, (2019) stated that on the job training focuses on developing and manifesting quality performance by use of modern aids, interesting skills or knowledge in respect of teaching subject. The corresponding hypothesis one revealed that there is no significant difference in the mean ratings of male and female accounting teachers in public secondary school on the extent to which on-the-job training enhances the subject matter delivery of accounting teachers in secondary schools in Port Harcourt Metropolis.

The findings in research question two with regards to extent to which collaboration of accounting teachers in public secondary schools can enhance efficient subject matter delivery in Port Harcourt metropolis showed that the responses were high, indicating a high extent to which collaboration of accounting teachers in public secondary schools enhances efficient subject matter delivery in Rivers State. This finding is in agreement with the view of Williams (2018) who opined that collaboration amongst accounting teachers, fosters problem-solving ability through the deepening of the understanding of both the content and the student, aligns strategies with students' needs and content goals, implementing, strategies with students and then reflect on their effectiveness. In agreement with the view Williams, Goddard, (2019) stated that, when teachers have opportunities to collaborate professionally, they build upon their distinctive experiences, pedagogies and content. In agreement with the view Williams, Goddard, Brodesky, Gross, Tigueand & Palmers (2020) stated that collaborative learning model for teachers fostered problem solving through the deepening of the understanding of both the content and the students, aligns strategies with students' need and content goals, implementing strategies with students and then reflect on their effectiveness, collaborating and planning lesson and assessments. The corresponding hypothesis two revealed that there is no significant difference in the mean ratings of male and female accounting teachers in public secondary school on the extent to which collaboration enhances the subject matter delivery of accounting teachers in public secondary schools in Rivers State.
The findings in research question three with regards to extent to which mentoring of accounting teachers in public secondary schools can enhance efficient subject matter delivery in Port Harcourt metropolis showed that the responses were high, indicating a high extent to which collaboration of accounting teachers in public secondary schools enhances efficient subject matter delivery in Rivers State. This finding is in agreement with the view of Walker (2019) who stated that, mentoring helps in improving instructional performance of novices through modeling by a top performer and socializing novices into the profession of teaching. In agreement with the view of Walker, Garet, Porter, Desimone, Birman and Yoon, (2019) stated that mentorship is the special relationship that is cultivated between a mentor and protégée whereby the mentor counsels, guides and helps the protégée to develop both personally and professionally.

In agreement with the view of Walker, Garet, Porter, Desimone, Birman and Yoon, Poden and Denmark (2020) stated that the purpose of mentoring efforts ranged from orientation and induction of new teachers to instructional improvement with the intent to change the culture of the school to a more collaborative learning environment. The corresponding hypothesis three revealed that there is no significant difference in the mean ratings of male and female accounting teachers in public secondary school on the extent to which mentoring enhances the subject matter delivery of accounting teachers in secondary schools in Port Harcourt Metropolis.

Conclusion

Based on the findings in the study, it was concluded that on-the-job training, teachers' collaboration and mentoring enhances the subject matter delivery of accounting teachers in secondary schools.

Recommendations

The following recommendations were made based on the findings;

1. Accounting teachers in secondary schools should be engaged in efficient on-the-job training in order to make them efficient in the delivery of subject matter.
2. Accounting teachers should collaborate more with each other to enhance their subject matter delivery in secondary schools.
3. Effective mentoring should be provided for accounting teachers in secondary schools to enhance their effectiveness in delivery accounting subjects.

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Lecturers Use of Accounting Information System in Teaching Management Accounting in Rivers State Universities

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Abstract

This study investigated lecturers' use of Accounting Information System in teaching Management Accounting in Rivers State Universities. The descriptive survey research design was adopted. Three research question and three null hypotheses guided the study. The population of the study comprised of 40 lecturers; 25lecturers from Rivers State University and 15lecturers from Ignatius Ajuru University of Education Rumuolumeni, Rivers State. The entire population was studied due to its manageable size. A structured questionnaire titled: Lecturers Use of Accounting Informations System in Teaching Management Accounting Questionnaire (LUAISTMA) was used for data collection. The instrument was validated by the supervisor and two other experts from Business Education Department and Measurement and Evaluation in Rivers State University .To determine the reliability of the instrument the test-retest method was adopted and Pearson Product Moment Correlation Coefficient was used to determine the reliability co-efficient index of 0.78. The instrument was administered to all the lecturers personally by the researcher and duly retrieved. The research questions were answered using Mean and Standard Deviation, while the hypotheses were tested with z-test statistics at 0.05 level of significance . The results revealed that lecturers utilize transactional processing, General ledger /factory ledger and financial reporting system and Management reporting system to a low extent in teaching management accounting in Rivers State University as well in Ignatius Ajuru University of Education. Base on the findings of the study, it was recommended among others, a review of curriculum to incorporate accounting information system in teaching Management Accounting in higher institutions and also ensure training/retraining of lecturers to be knowledgeable with new technologies for effective instructional delivery of Accounting in Rivers State Universities.

Keywords: Lecturers, Accounting Information, Management Accounting, Organization.

Introduction

The allocation of scarce resources, which was the problem of every organization, government and individual throughout the entire world, brought the need for the introduction of Management Accounting profession (Dennis, 2012). Management Accounting is the information a manager needs in making decisions. It is the information provided to external users, hence, both Financial Accounting and Management Accounting deals with the allocation of resources, they all have their specifications (Dennis, 2012). Management Accounting provides information that helps the managers control activities within the firm and decide on what product to sell, where to sell them, how to source those product and which manager(s) to entrust the company's resources. Management Accounting is important because it is that proprietary information.

The public companies are generally not required to disclose management accounting data, nor much detail about the systems that generate this information. Typically, companies disclosed very little management accounting information to investors and analyst, beyond what is imbedded in financial reporting requirements, even every basic information, such as unit sales by major product category or product cost by product types is reported and when it is reported, one can be sure that management believe voluntary disclosure of this information will be viewed as good news by the market place. Secondly management accounting information is important, such that it is difficult for a company to gain a competitive advantage by installing a better management accounting system than its competitors. Management accounting helps in measuring and reporting information about economic activity within organizations for use by managers in planning, performance evaluation and operational control. Management Accounting according to Dennis (2012) is characterized with the planning, performance evaluation and operational control. Planning is the decision on what product to make and where to make them. Determining materials, labor and other resources that are needed to achieve desired output. In non-profit organizations, deciding which programs to fund. In Performance evaluation, evaluating the profitability of individual products and product lines, determining the relative contribution of different Managers and different parts of the organizations. In non-profit organizations it evaluates the effectiveness of managers, departments and programs. Operational control is concerned with knowing how much work in process is on the factory floor and at what stages of completion to assist the line manager in identifying bottlenecks and maintain a smooth flow of production. The management accounting system is usually field into financial accounting system, particularly the product costing system, which is usually used to help determine inventory balance sheet amounts and the cost of sales for the income statement.

Management accounting information is usually financial in nature and dollars denominated, although increasingly management accounting system collect and report non-financial information as well. The mechanical process of collecting and processing information posed substantial and interesting challenge to large organization. There are important conceptual issues about how to aggregate information in order to measure report and analyzed cost, issues on how to allocate costs across products services customers, subunits of the organization and time periods, raised questions of substantial intellectual content, to which there are often no clear answers. Management Accounting is used by business, not for profit organizations, government and individuals. Business is categorized by sector of the economy in which they operate, such manufacturing firms turn raw materials into finished goods and will also include in this categories agricultural and natural resource companies. Merchandising firms buy financial goods for resale, service sector companies sell service such as legal advice, hairstyling and cable television and carry little, if any inventory. Businesses use management accounting extensively, also individuals use the economic concepts that form the foundation of management accounting in their personal lives, to assist in decisions large and small home and automobile purchases retirement planning and splitting the cost of a vocation rental with friends.

The modern organizational communication is within internal and external world, and will depend on credible interpretation of information. According to Koko (2009), the major organizational task is standardized and mechanized, meaning that workers roles are restricted to the laid down procedures for operation. The present innovations in the industries have reform the traditional organizations information method to modern stereotyping and state of affairs which includes the method in which organizations process record, analyze, summarize and interpret accounting information to the stakeholders of the company. Accounting plays a vital role in management and management decision making (ICAN study text for management information, 2014).

Accounting Information System (AIS) is generally a computer-based method for tracking accounting activities in conjunction with information technology resources (Fontinelle in Ferdinando and Antonio, 2013). Accounting Information Systems is responsible for the collection, storage and processing of financial and accounting data that is used for internal and external management decision making, including non-financial transactions that directly affect the processing of financial decision transaction, through the use of Enterprise Resource Planning (ERP) technologies that facilitate all transaction system of the organization.

This ERP technology facilitates accounting activities that deals mainly with the legal aspect of accounting and reporting to parties that are external to the organization. These Accounting system is subdivided into groups, such as Accounting operations, Which represents activities like debtors and creditors, management, financial risk and leverage, treasuring and budgeting issues, corporate financial issues related to taxes, interpretation of available management accounting information, internal audits, short term and as well as cash management support system, which include strategic and tactical options, decision making, various personnel and bench marking responsibility accounting. The swing in accounting from traditional brought about the need for the shift towards strategic management guidance and network support system, which is a big challenge of traditional accounting method. Most of accounting concern, is on accounting cycle transactional processing, account payable and account receivables, internal and external financial reporting issues, external reporting statutory meeting and reporting operation and financial issues, risk management and regulations like internal audit compliance management, tax matters, treasury and audit issues, management accounting, job order costing and processing costing, cost volume and profit analysis, budgeting, being short term and long term, forecasting, reporting on standard costing which includes variances analysis (Mohammed and Colin, 2012).

Management accounting information is the information that helps the managers in running the business (Mohammed and Colin, 2012). Management accounting is defined in line with Oxford Accounting Dictionary (1995), as the techniques used to collect, process and present financial and quantitative data within an organization to help effective performance, measurement. This enable the management accountant to partnering with management decision making, planning and performance management system and providing expertise in financial reporting and control to assist management in the formulation and implementation of an organizational strategy, which is associated with higher value and more predictive information (Rewan, 2019).

The changes in commercial enterprise, emphasizes the need for complete transparent, reliable and correct statistics that can be accessed quickly, enabling organization to respond more innovatively with the job of Management Accountant (MA), in the use of transactional processing system, General Ledger/Factory Ledger System and Financial Reporting System and Management Reporting System. The transactional processing system is the system that supports the day to day business operations, separating them into three groups of transactional cycle, which includes the revenue cycle, the expenditure cycle and the conversion cycle. The transactional processing system is to automate business process as the first accounting transactional processing information system, according to Hall in Ferdinando and Antonio, (2013). While the General Ledger /Factory Ledger System and Financial Reporting System are two systems that work together. General Ledger is dedicated to summarize transaction cycle activity, using average balance processing for specific set of books and the second, which is financial reporting system, measures and report status of financial resources, general output in the form of financial statement or tax returns to external enterprise. The management reporting system is the scope of management information system, offering special purpose on financial reporting and information needed for decision making, such as budgets, variance report, and responsibility report.

The modern management information system is designed to provide data from an integrated computer database which is constantly updated from all areas of the organization in a structured way, given access to the data is usually restricted to area regarded as useful to a particular manager. Management reporting system provides information and basic inputs for job order costing, process costing, cost volume, profit analysis, ABC, cost variance analysis, budgeting short and long term, cash flow, payroll, material handling including perpetual and period issues, EOQ, internal departmental transfers, bonus and right issues, ratio analysis, preparation of branch account, (independent and foreign branch), contract account, joint venture accounts, banking transaction, alongside with reconciliation statement cash book. This is as a result of the introduction of Enterprise resource planning, blended to facilitate all vital functions of present organization in the implementation of the new Business Intelligence (BI) and Accounting Information System (AIS), with its facilities, which is the answer to this accounting domain.

Today, management accounting practice has lost its relevancy with recent business environment, (Johnson, in Rewan 2019). Management Accounting techniques represent a genuine initiative for implementation of change that has been made which involves the need for change, a vision of change and strategy, innovation stimulation (Albu and Albu, in Rewan, 2019). The transformation of production techniques and management accounting techniques has predominant implications at the information released by operational system of the organization. Using the underlying technology as a critical part of any Accountant job, indicating challenges for all that study accounting as a course, while offering opportunities to those who learn effective information management and business measurement professionals, Which complement the opinion of Mohammed and Colin, (2012), as the effective preparation for future management accountants, becomes the challenge of every lecturer in the field, even in adopting to the advance technological improvement in the analysis of cost and price data, also assessing the risk and benefits relating to organization e-business and develop control necessary to ensure a secured and reliable web, presence for the improvement of management in complying to Sox section 404 or audit management internal control system.

The legal issues inherent in the work of accountants requires such that a lecturer in Rivers State Universities will be credible in the interpretations of management accounting information using different method to ensure that students learn the concept presented and equally put into practical format in the real business world. The traditional methods of teaching management accounting in Rivers State Universities should be reconsidered with management internal control system. According to Rai (2021), the teaching profession is filled with countless opportunities to enrich the academic lives of students and making educational objective easy for students to grasp, others may require creativity to ensure that important learning objectives are met. These concept enables the teaching strategies used to be in line with the contextual learning theory where the aim of education is the integration of content learnt with real world experience. The 21st century teacher's objective for teaching accounting at the undergraduate level is to train the students with solid theoretical basis, strong practical ability and high comprehension quality. Panham in Rai (2021), opined that the routine learning method used by the teachers, traditionally made learning more difficult, therefore require teachers to device means of making learning more students centered approach from teachers centered approach. Teaching accounting is different from teaching others courses like language, history or science. The Accounting teacher's duty is to teach accounting and also teach the major social ethics in business and how to stand in globalized age of business (Panham as cited in Rai, 2021). This statement is in line with Koko (2019) opinion on the recent trend and development in science and technology, making it mandatory for every office to improve on the standards and quality of its delivery of services which makes need for qualify personnel, and recently change in office operations which utilize the electronic method of data processing demands concerted efforts in training workers to adapt to these changes.

According to Koko, Business Education curriculum is structured to cover two major broad areas of business, first is the General business management which consists of management in business, accounting in business, marketing business, which design is to cater for economics, production management, financial accounting, wholesale and retail market, structured to expose the relationship between entrepreneurship and cooperate study. Secondly, generally management covers skill acquisition area, such as key boarding techniques, information and communication management techniques and records management, which focuses on service and skill training requirement of an office. Amesi (2015) asserted the need for staffing in entrepreneurship, to be done by people in view of production and analysis of staff requirements and filling the various positions with the right persons, to determine the structure of the firm, stating that business owners, as entrepreneurs need to handle there day to day operations of the business as well as decision making obligations that determine the organizations fact with the opinion, stating that every entrepreneur should learn more, including taking relevant courses related to his future business and trying to be careful about wasting money and other materials in his business operations. The American Institute of Chartered Accountants identified teaching strategies and classroom techniques that may be used in teaching technical contents in accounting courses, and that it will also address one or more of core competencies or elements of core competencies using transaction processing system, general ledger/factory ledger system and financial reporting system and management reporting system. This teaching strategies described with example to eradicate the traditional accounting method and embrace the modified and innovated methods to include active element such as pausing for discussions among the students, including immediate mastering tests/quizzes on lecture materials, using demonstrations in responding to pre-submitted students generated questions.

Statement of the Problem

Changes in the Accounting practice from traditional method of class room teaching and interpretation of information related to management accounting concept to the practical implementation of technological concept in today world of Business, affect the young graduates in their job performance of accounting application in the modern industries. This is because of the integration of technologies into the practical aspect of the implementation of management accounting concept in the world of work to advance the goals of every organization. Closing the gap between class room teaching and learning method from the modern information technology practice in the market as a means of transaction in today's world will be an advantage to the lecturers in the interpretation of management accounting information along with the modern curriculum of Accounting in Rivers State Universities, thereby improving the performance of accounting graduates in professional examinations. The change led to retraining of all accounting teachers even in the field of education to learn the subsystem in accounting transactions with enterprise resources planning technology, which deals with Transactional Processing System (TPS), General Ledger and Financial Report System (GL/FRS) and Management Reporting Systems (MRS) in order to transfer the right knowledge to students. The implementation of these mandates is still at the cradle, affecting the integrations of different technological facilities in teaching management accounting to be at the state of affairs. These negative effects triggered the researchers' interest, to examine the extent to which lecturers use accounting information system in teaching management accounting in Rivers State Universities.

Purpose of the Study

The purpose of the study was to investigate the extent to which lecturers use accounting information system in teaching management accounting in Rivers State Universities. Specifically, the study examined the:

1. Extent to which lecturers use Transactional Processing System (TPS) in teaching management accounting in Rivers State Universities.
2. Extent to which lecturers use Financial Reporting System (FRS) in teaching management accounting in Rivers State Universities.
3. Extent to which lecturers use Management Reporting System (MRS), in teaching management accounting in Rivers State Universities.

Research Questions

The following research questions guided the study:

1. To what extent do lecturers use Transactional Processing System in teaching management accounting in Rivers State Universities?
2. To what extent do lecturers Financial Reporting System (FRS) in teaching management accounting in Rivers State Universities?
3. To what extent do lecturers use Management Reporting System (MRS) in teaching management accounting in Rivers State Universities?

Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance

1. There is no significant difference in the mean ratings of lecturers in Rivers State University and Ignatius Ajuru University of Education on the extent to which Transactional Processing System (TPS) is used in teaching management accounting in Rivers State Universities.
2. There is no significant difference in the mean ratings of lecturers in Rivers State University and Ignatius Ajuru University of Education on the extent to which Financial Reporting System (FRS) are used in teaching management accounting in Rivers State Universities.
3. There is no significant difference in the mean ratings of Lecturers in Rivers State University and Ignatius Ajuru University of Education on the extent to which Management Reporting System (MRS) is used in teaching management accounting in Rivers State Universities.

Methodology

The study adopted the descriptive survey research design. This study was carried out in Rivers State University (RSU) and Ignatius Ajuru University of Education (IAUE). The population of the study comprised of 25 RSU Accounting lecturers, 6 from Business Education, 19 from Management and Administrative Sciences and 15 IAUE Accounting lecturers, given a total of 40 lectures. Since the population size is manageable, the entire population was used for the study. The instrument for data collection was a structured questionnaire titled; "Lecturers Use of Accounting Information System in Teaching Management Accounting" (LUAISTMA). The instrument was designed to elicit the opinion of the respondents on extent to which lecturers use accounting information system in teaching management accounting in Rivers State Universities. The instrument was divided into two sections. The first section was made up of background information of the respondents. The second was made up of statements relating to the variables raised in the research questions and hypothesis. The instrument was validated by the supervisor and three other experts, two in the department of Business Education and one in Measurement and Evaluation. Their suggestion was incorporated into the final design of the instrument, which made the questionnaire to have face and content validity. The reliability of the instrument was established using test re-test method and was correlated using Pearson Product Moment Correlation Coefficient(r) and a reliability coefficient index of .0.78 was established. 40 copies of the instrument were administered to the respondents through personal contact and all was duly retrieved after filling. The data collected was analyzed using mean and standard deviation for research question while the hypothesis was tested using z-test at 0.05 level of significance. Data analysis was interpreted using a modified 4-point rating scale, of High extent (HE), 4-points, Moderate extent (ME), 3-points, Low Extent (LE), 2-points and Very Low Extent (VLE), 1-point. Any item with a mean value equal to or greater than 2.50 was regarded as high extent, while mean value less than 2.50 was regarded as low extent by the respondents.

Results

Research Question 1

To what extent do lecturers use Transactional Processing System (TRS) in teaching management accounting in Rivers State Universities?

Table 1: Mean score of RSU and IAUE Lecturers on the Extent of use of Transactional Processing System in teaching Management Accounting (N=40)

S/N	Use of transactional processing system in teaching management accounting	RSU lecturers x1	SD1	Decision	I A U E lecturer x2	SD2	Decision
1	Use computer in teaching management accounting	1.32	0.14	VLE	1.17	0.68	VLE
2	Use enterprise resource planning in teaching management accounting	2.95	0.82	ME	2.79	1.02	ME
3	Use computer transaction cycle in teaching and analysis of accounting information	2.18	0.18	LE	1.13	0.38	VLE
4	Use computer batch transaction cycle in teaching management accounting.	1.93	0.16	VLE	1.38	0.45	VLE
5	Use technology real time transaction cycle in teaching management accounting	2.13	0.19	NU	1.84	0.35	LE
6	Use magnetic tape in teaching batch transaction	1.26	0.16	VLE	1.12	0.34	VLE
7	Use technology in teaching scheduling convenient and economic time for job	2.13	0.19	LE	1.25	0.63	VLE
8	Use system reservation in teaching setting aside product or service	1.26	0.13	VLE	1.55	0.65	VLE
9	Use point of sales in teaching inventory control in management accounting	1.58	0.14	VLE	1.07	0.28	VLE
10	Use system bar codes in teaching identifying product and pricing product	1.26	0.13	VLE	1.18	0.50	VLE
	Grand Mean/Std	**1.89**	**0.22**	VLE	**1.44**	**0.52**	VLE

Source: *Field Survey 2024*

Table 1 shows the extent of utilization of transactional processing system in teaching management accounting in Rivers State Universities. The table reviewed that 1 out of the 10 transactional processing system items listed; only 1 was reported high while nine was very low. The grand mean of 1.89 and 1.44 for RSU and IAUE lecturers was less than the averages mean score of 2.5. This indicates that Transactional Processing Systems is not used by lecturers in teaching Management Accounting in Rivers State Universities.

Research Question 2

To what extent do lecturers use Financial Reporting System (FRS) in teaching management accounting in Rivers State Universities?

Table 1: Mean score of RSU and IAUE Lecturers on the Extent of use of Financial Reporting System in teaching Management Accounting (N=40)

S/N	Use of general financial reporting system in teaching management	RSU lecturers x1	SD1	Decision	I A U E lecturer x2	SD2	Decision
1	Use general ledger system in teaching conversion of foreign currency	1.55	0.66	VLE	1.53	0.25	VLE
2	Use information system in teaching summary of transaction cycle activities	1.67	0.63	VLE	1.46	0.57	VLE
3	Use of general ledger system in teaching to determine average standard balance	1.62	034	VLE	1.64	0.20	VLE
4	Use factory ledger in teaching manufacturing accounting	1.85	0.35	VLE	1.35	0.45	VLE
5	Use factory ledger system in teaching recording operation and activities	1.76	0.45	VLE	1.49	0.62	VLE
6	Use factory ledger system in teaching inventory in management accounting	1.60	0.38	VLE	1.57	0.72	VLE
7	Use general ledger system and financial reporting system in teaching the same accounting concept	1.72	0.56	VLE	1.70	0.62	NU
8	Use financial reporting system in teaching measurement and reporting statement of resources	1.55	0.28	VLE	1.51	0.54	VLE
9	Use computer system in teaching how to check effective transaction date and time	1.64	0.28	VLE	1.51	0.54	VLE
10	Use computer system in teaching to control transaction calendar	1.55	0.65	VLE	1.12	0.67	VLE
	Grand Mean/Std	**1.65**	**0.49**	VLE	**1.47**	**0.55**	VLE

Source: *Field Survey 2024.*

Table 2 shows the extent lecturers utilize Financial Reporting System in Teaching Management Accounting in Rivers State Universities. The table revealed that all the ten 10 items listed were reported a low extent. The grand mean of 1.65 and 1.47 for RSU and IAUE was lower than the average mean score of 2.5. This indicates that Financial Reporting Systems is not used by lecturers in teaching Management Accounting in Rivers State Universities.

Research Questions 3

To what extent do lecturers use Management Reporting System (MRS) in teaching management accounting in Rivers State Universities?

Table 1: Mean score of RSU and IAUE Lecturers on the Extent of use of Management Reporting System in teaching Management Accounting (N=40)

S/N	Use of management reporting system in teaching management accounting	RSU lecturers x1	SD1	Decision	I A U E lecturer x2	SD2	Decision
1	Use management reporting system in teaching how to provide special purpose financial reporting	1.87	0.85	VLE	1.70	0.54	VLE
2	Use management reporting system in teaching decision making such as budget and variance	1.73	0.75	VLE	1.75	0.45	VLE
3	Use management reporting system in teaching summary of transaction cycle	1.52	0.68	VLE	1.62	0.49	VLE
4	Use management reporting system in teaching how to provide general output such financial statement and tax return	1.63	0.86	VLE	1.37	0.63	VLE
5	Use computer database in teaching how to access update	1.75	0.75	VLE	1.75	0.91	VLE
6	Use management reporting system in teaching job order, process costing, profit analysis, activity base costing etc.	1.67	0.96	VLE	1.62	0.87	VLE
7	Use management reporting in teaching inventory management, economic order quantity (EOQ)	1.62	0.72	VLE	1.75	0.77	VLE
8	Use enterprise resource planning in teaching management accounting information	1.57	0.72	VLE	1.44	0.16	VLE
9	Use management reporting system in teaching electronic method	1.77	0.96	VLE	1.37	0.76	VLE
10	Use management reporting system in teaching daily transaction as an accountant.	1.63	0.89	VLE	1.50	0.64	VLE
	Grand Mean/Std	**1.67**	**0.89**	VLE	**1.58**	**0.56**	VLE

Source: *Field Survey 2024.*

Table 3 shows the extent lecturers utilize Management Reporting System in Teaching Management Accounting in Rivers State Universities. The table revealed that all the 10 items listed were low extent. The grand mean of 1.67 and 1.58 for RSU and IAUE was lower than the average mean score of 2.5. This indicates that Management Reporting Systems is not used by accounting lecturers in teaching Management Accounting in Rivers State Universities.

Hypothesis 1

There is no significant difference in the mean ratings of lecturers in Rivers State University and Ignatius Ajuru University of Education on the extent to which Transactional Processing System (TPS) is used in teaching management accounting in Rivers State Universities.

Table 4: Z-test result of RSU and IAUE lectures on the extent to which Transactional Processing System is used in teaching Management Accounting In Rivers State Universities

Groups	Mean	SD	DF	P	Z.cal	Z-crit	Decision
RSU 25	1.89	0.22					
			38	0.05	0.27	0.96	Accepted
IAUE 15	1.44	0.52					

Source: Field Survey, 2024.

Table 4 shows that the calculated z-value was 0.27 which was less than the critical value of 1.96 at 0.05 level of significance and 38 degree of freedom (df). This indicates acceptance of the null hypothesis; thus, there is no significant difference in the mean ratings of lecturers in Rivers State University and Ignatius Ajuru University of Education on the extent to which Transactional Processing System (TPS) is used in teaching management accounting in Rivers State Universities.

Hypothesis 2

There is no significant difference in the mean ratings of lecturers in Rivers State University and Ignatius Ajuru University of Education on the extent to which Financial Reporting System (FRS) is used in teaching management accounting in Rivers State Universities.

Table 5: Z-test result of RSU and IAUE lectures on the extent to which Financial Reporting System is used in teaching Management Accounting In Rivers State Universities

Groups	Mean	SD	DF	P	Z.cal	Z-crit	Decision
RSU 25	1.65	0.49					
			38	0.05	0.10	1.96	Accepted
IAUE 15	1.47	0.55					

Source: Field Survey, 2024.

Table 5 shows that the calculated z-value was 0.10 which was less than the critical value of 1.96 at 0.05 level of significance and 38 degree of freedom (df). This indicates acceptance of the null hypothesis; thus, there is no significant difference in the mean ratings of lecturers in Rivers State University and Ignatius Ajuru University of Education on the extent to which Finanacial Reporting System (FRS) is used in teaching management accounting in Rivers State Universities.

Hypothesis 3

There is no significant difference in the mean ratings of lecturers in Rivers State University and Ignatius Ajuru University of Education on the extent to which Management Reporting System (FRS) is used in teaching management accounting in Rivers State Universities.

Table 5: Z-test result of RSU and IAUE lectures on the extent to which Financial Reporting System is used in teaching Management Accounting In Rivers State Universities

Groups	Mean	SD	DF	P	Z.cal	Z-crit	Decision
RSU 25	1.67	0.81					
			38	0.05	0.14	1.96	Accepted
IAUE 15	1.58	0.56					

Source: Field Survey, 2024.

Table 6 shows that the calculated z-value was 0.14 which was less than the critical value of 1.96 at 0.05 level of significance and 38 degree of freedom (df). This indicates acceptance of the null hypothesis; thus, there is no significant difference in the mean ratings of lecturers in Rivers State University and Ignatius Ajuru University of Education on the extent to which Management Reporting System (FRS) is used in teaching management accounting in Rivers State Universities.

Discussion of Findings

The result on lecturers' use of Transactional Processing System in teaching Management Accounting in Rivers State Universities revealed that lecturers in RSU and IAUE use Transactional Processing System to a low extent in teaching Management Accounting in Rivers State Universities. It was also discovered that no significant difference existed in the mean ratings of RSU and IAUE on the extent to which they use transactional processing system in teaching management accounting in Rivers State Universities. The finding is in line with the result of Mohammed and Colin (2012), who observed that accounting concern is on transactional processing, account payable and account receivable, internal and external financial reporting issues, external reporting statutory meetings and reporting operation and financial issues, risk management and regulations like audit compliance management, tax matters, treasury and audit issues, management accounting, job order costing and processing costing, cost volume and profit analysis, budgeting, forecasting and Standard costing including variance analysis.

The result on lecturers' use of Financial Reporting System in Teaching Management Accounting in Rivers State Universities revealed that lecturers in RSU and IAUE use Financial Reporting System to a low extent in teaching Management Accounting in Rivers State Universities. It was also discovered that no significant difference existed in the mean ratings of RSU and IAUE lecturers on the extent of use of Financial Reporting System in Teaching Management Accounting in Rivers State Universities. The finding is in consonants with the result of Rewan (2019) who posits that the modern management information system is designed to provide data from an integrated computer database which is constantly updated from all areas of the organization in a structured way, such that given access to the data is usually restricted to area regarded as useful to a particular manager but providing information and basic inputs for job order costing, processing, cash flow, payroll, materials handling including perpetual and periodic issues, EOQ, departmental transfer etc. with the help of enterprise resource planning, New business intelligence with Accounting Information System blended to facilitate all vital functions of present organizations and answer to all accounting domain.

The result on lecturers' use of Management Reporting System in teaching management accounting in Rivers State Universities revealed that lecturers in RSU and IAUE use Management Reporting System to a low extent in teaching Management Accounting in Rivers State Universities. . It was also found out that no significant difference existed in the mean rating of RSU and IAUE lecturers on the extent to which they use Management reporting system in teaching management accounting in Rivers State Universities. The finding is in agreement with Ferdinando and Antonio (2013) who stated that Accounting Information System is generally a computer-based method for tracking accounting in conjunction with information technology resource.

Conclusion

Accounting Information System such as Transactional Processing System, Financial Reporting System and Management Reporting System have great positive impact on accounting profession. Many global issues have call for the increased emphasis on the use of technological accounting information in teaching management accounting. Hence several technologies have provided for effective teaching of Management accounting in the institutions. However, this study revealed that lecturers in RSU and IAUE use Accounting Information System to a low extent in teaching Management Accounting in Rivers State Universities.

Recommendations

Base on the findings of this study, the following recommendations were made:

1. Institutions administrators and other stakeholders should ensure the provision and use of Transaction Processing System in the instructional delivery of Management Accounting as this will help instill the required accounting skills for job performance in today electronic world of business.
2. Institutions administrators and other stakeholders should ensure the provision and use of Financial Reporting System in the instructional delivery of Management Accounting as this will help instill the required accounting skills for job performance in today electronic world of business.
3. Institutions administrators and other stakeholders should ensure the provision and use of Management Reporting System in the instructional delivery of Management Accounting as this will help instill the required accounting skills for job performance in today electronic world of business.

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The Impact of Facilities on Rental Values of Residential Properties in Port Harcourt City Local Government Area of Rivers State

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Abstract

This study aims at ascertaining the Impact of Facilities on Rental Values of Residential Properties in Port Harcourt City Local Government Area of Rivers State, using residential properties located within Peter Odili Road, Port Harcourt City. The study adopted survey research design. The population of this study comprised of 338 Estate Surveyors and Valuers in Rivers State, 100 landlords and 100 tenants, making a total of 538 respondents. Census sampling techniques was used for the study. Three research questions guided the study. A structured instrument titled impact of facility on rental values of residential properties questionnaire (IFORVORPQ) was used for data collection. Out of the 538 questionnaires distributed, 484 were returned, reflecting a 90% rate. The reliability of the instrument was determined through test re-test method. Mean and standard deviation were used to analyse the research questions. The findings revealed that water supply, power supply, refuse disposal, security, house cleaning, internet facilities, drainage channel, kitchen facilities and furniture were provided in most of the residential properties in Port Harcourt City L.G.A. More so, the level of satisfaction derived from the facilities provided within the residential properties was high and the provision of the facilities had impacts on rental values of residential properties in Port Harcourt City L.G.A of Rivers State. Based on the findings, it was recommended among others that Property owners, managers and government should prioritize the inclusion of modern facilities in residential properties during the development process, Property developers (landlords), property managers and Government Housing Agencies should regularly assess, carry out routine check to ensure good conditions of the facilities in their residential properties.

Keywords: *Facilities, Housing, Rent, Value, Residential Properties*

Introduction

Residential properties have continued to attract real estate developers' interest because of the increasing demand especially in the urban centres (Adebayo, 2016). In Nigeria today, housing issues are diverse and very much complex to comprehend, and it is more acute in the urban areas because of large and high influx of people from rural to the urban centres. This urbanization process has resulted in over-crowding of the urban centres, lack of homes or development of sub-standard housing as well as slum and squatter developments. According to Samson (2013), the ever growing population in the country and the resultant cumulative housing deficit has today left the country with between 16-17 million housing units' deficit. Because of this rise in population that has led to a rapid urbanization, scarcity of resources, lack of equity capital and unfavourable loan plans, many cannot provide for themselves personal accommodations for dwelling, hence, they resort to rented houses for accommodation. The issue becomes the ability of both tenants and prospective tenants who are in demand of these properties for rental purpose to afford the rent because of the constant increase in rental value (Otegbulu, 2020).

According to Black (1999), housing prices shows the renter's view of particular attributes of the property. To Aluko (2011), there exists, several factors that determine rental value of residential properties. The determinants of individual property rental value include location, state of repair, time, accommodation details and facilities. These factors affect properties, causing either "increase" or "decrease" in rental values. Adebayo (2016) affirmed that facility is one of the factors that causes property value to increase or decrease. Nubi (2020) averred that facilities are very essential in residential properties contributing to the wellbeing of the users or occupants as well as allowing a building to function effectively.

In the study of Black (1999), the finding shows that houses with good facilities are far more expensive than similar houses that are deficient in these attributes. To Mallo and Anigbogu (2009), housing facilities affect rent charged on residential properties but there are inequalities in the living conditions of residents across neighbourhoods due to differences in availability of these facilities. They concluded that houses in the low density areas are of greater value than those in high density areas because of the overall quality of housing infrastructure and availability of adequate housing facilities per household size. Olujimi and Bello (2009) showed the effects of infrastructural facilities on the rental values of residential properties in Akure and revealed that facilities contributed 30.5 percent in the determination of rental values of residential buildings. It was noted that these facilities such as water supply, electricity, security, house cleaning, toilet facilities, kitchen facilities amongst others are important; tenants are willing to pay more for houses with security facilities since they value the safety and security of their lives and property more than the aesthetic quality of the properties.

Statement of problems

In the recent past, because of the growing population and the rise in demand for residential properties, property owners and managers have formed the habit of establishing how much rent their property should command. This is mostly done by adjusting rent to reflect a comparable market value of similar properties without taking proper cognizance, the facilities provided and the impacts of such facilities on the rental values of such property. Also, the issue of how to take into consideration the provision of facilities in determining rental values by Estate Surveyors and Values is still of concern. These however, have led to many properties commanding lesser or higher rent than they should command in the market, culminating in a misleading rental data within the location. The implication is that whatever purpose the rental data will be used for, including Valuation and forecasting, will be misleading. Hence, the need to investigate and assess the impact of facilities on rental values in Port Harcourt. The outcome of this investigation will aid Values when carrying out rental valuation to understanding the impact of and to apply the value of those facilities in rental value determination.

Purpose of the Study

The purpose of this study is to:

1. Identify the facilities available in residential properties within Port Harcourt City Local Government Area of Rivers State.
2. Examine the level of satisfaction of tenants/users with the facilities in residential properties within Port Harcourt City Local Government Area.
3. Ascertain the impact of the facilities on rental values of residential properties in Port Harcourt City Local Government Area of Rivers State.

Research Questions

The following research questions were answered:

1. What are the facilities provided in residential properties in Port Harcourt City Local Government Area of Rivers State?
2. What is the level of satisfaction derived from the facilities provided within the residential properties in Port Harcourt City Local Government Area of Rivers Stat
3. What are the impacts of the facilities on rental values of residential properties in Port Harcourt City Local Government Area of Rivers State?

Methodology

The research design adopted in this study is the descriptive Survey Design. The area of the study is Rivers State, Port-Harcourt. The population for the study consist of 538 respondents encompassing of 100 landlords, 100 tenants and 338 practicing Estate Surveyors and Valuers in Rivers State. Census sampling techniques was used for the study since the population is sizable; therefore, the entire 538 respondents were used as the sample for the study. An instrument titled: impact of facility on rental values of residential properties questionnaire (IFORVORPQ) was used to gather primary data for the study.

The Questionnaire was structured using the Likert scale as a means of obtaining objective contribution on the subject investigated. To determine the content and face validity of the questionnaire, copies were submitted to one expert in measurement and evaluation and two others in the Department of Estate Management, Rivers State University. Their comments were used to effect corrections on the final copy before administration to the respondents. The reliability of the instrument was estimated using the Cronbach Alpha reliability method for a measure of internal consistency. The sample for determination of the Cronbach Alpha was 20 respondents. Cronbach Alpha statistics was used to determine the reliability co-efficient of the instrument with the aid of Social Package for Social Science (SPSS) which yielded reliability co-efficient of 0.80, thereby making the instrument reliable for data collection. Data collected through survey instrument was analysed with Statistical Package for Social Science (SPSS). Mean and percentage were used to answer the research questions. In analysing the data obtained from the questionnaire, the frequencies of response for each questionnaire items were calculated. The scores of responses were converted to frequency counts and the mean scores were computed based on the values assigned to the five responses shown in the following forms: Strongly Agree(SA) - 5, Agree (A) -4, Uncertain (U) -3 Disagree (D) - 2 and Strongly Disagree (SD)-1Highly Satisfied (HS) -5, Satisfied (S) -4, Undecided (U) -3, Dissatisfied (D) -2 and Highly Dissatisfied (HD) -1 Very Good (VG) -5, Good (G) -4, Undecided (U) -3, Poor (P) -2 and Very Poor (VP) -1

$$\frac{5+4+3+2+1}{5} = \frac{15}{5} = 3.00.$$

Therefore, the 3.00 was referred to as criterion mean (mean cut-off point; decision point; to accept or reject an item).

Results

Research Question One: What are the facilities provided in residential properties in Port Harcourt City Local Government Area of Rivers State?

Table 4.2.1: **Facilities Provided in Residential Properties in Port Harcourt City LGA of Rivers State (N =484)**

S/N	Facilities Provided	Category	Yes	No
1	Water supply		290	194
2	Power supply		280	204
3	Refuse disposal		300	184
4	House cleaning		114	370
5	Internet services		64	420
6	Security		285	199
7	Toilet facilities		420	64
8	Drainage channel		134	350
9	Kitchen facilities		114	370
10	Furniture		24	460

Source: Researcher's Field Survey, 2024

Table 1 shows the responses on thefacilities provided in residential properties in Port Harcourt City Local Government Area of Rivers State. The study reveals that290 agreed on the provision of water supply, while 194 disagreed. 280 agreed on provision of power supply, while 204 disagreed. 300 said yes to the provision of refuse disposal, while 184 said no. 114 said yes to the provision of housekeeping and kitchen facilities while 370 said no. 64 agreed on provision of internet facilities while, 420 disagreed. 285 agreed on the provision security, while 199 disagreed. 420 agreed on the provision of toilet facilities, while 64 disagreed. 134 agreed on the provision of drainage channel, while 350 disagreed. 114 agreed on provision of furniture, while 370 disagreed. 24 agreed on provision of furniture, while 460 disagreed. Therefore, this indicates that water supply, power supply, refuse disposal, security and toilet facilities were provided in the residential buildings in Port Harcourt City L.G.A, while housekeeping, internet facilities, drainage channel, kitchen facilities and furniture were not provided by the landlords of the residential properties before the occupants' resume using the properties in Port Harcourt City L.G.A of Rivers State.

Research Question 2: What is the level of satisfaction derived from the facilities provided within the residential properties in Port Harcourt City Local Government Area?

Table 2: Level of Satisfaction Derived from Facilities Provided within the Residential Properties in Port Harcourt City (N = 484)

S/N	Items	5 HS	4 S	3 I	2 D	1 HD	$\bar{x}$	Ranking	Remark
1	Water supply	264 (1320)	185 (740)	- (0)	20 (40)	15 (15)	4.37	1st	Accepted
2	Power supply	245 (1225)	205 (820)	- (0)	24 (48)	10 (10)	4.35	2nd	Accepted
3	Toilet facilities	248 (1240)	183 (732)	- (0)	30 (60)	23 (23)	4.25	3rd	Accepted
4	House cleaning	230 (1150)	194 (776)	10 (30)	37 (74)	13 (13)	4.22	4th	Accepted
5	Security	225 (1125)	190 (760)	- (0)	49 (98)	20 (20)	4.14	5th	Accepted
6	Refuse disposal	224 (1120)	168 (672)	15 (45)	30 (60)	47 (47)	4.02	6th	Accepted
7	Kitchen facilities	199 (995)	175 (700)	- (0)	90 (180)	20 (20)	3.92	7th	Accepted
8	Internet service	199 (995)	165 (660)	- (0)	79 (158)	41 (41)	3.83	8th	Accepted
9	Drainage channel	200 (1000)	89 (356)	- (0)	128 (256)	67 (67)	3.57	9th	Accepted
10	Furniture	10 (50)	14 (56)	- (0)	354 (708)	106 (106)	1.90	10th	Accepted
	Grand						**4.07**		**Accepted**

Decision rule: Criterion Mean 3.00 and above was accepted, while below 3.00 was rejected

Source: Researcher's Field Survey, 2024

Table2 reveals the level of satisfaction derived from the facilities provided within the residential properties in Port Harcourt City L.G.A. The table shows that majority of 264 agree that satisfaction derived from water supply is highly satisfactory, majority of 245 agree that that satisfaction derived from power supply is highly satisfactory, majority of 224 agree that satisfaction derived from refuse disposal is highly satisfactory. Majority of 230 agree that satisfaction derived from housekeeping is high,majority of199 agree that satisfaction derived from internet facilities is high, majority of225 agree that satisfaction derived from security is highly satisfactory, majority of248 agree that satisfaction derived from toilet facilities is highly satisfactory,majority of200 agree that satisfaction derived from drainage channel is highly satisfactory, majority of199 agree on high satisfaction derived from kitchen facilities, while majority of228 agree on high satisfaction derived from furniture in the residential properties of Port Harcourt City L.G.A

Again, the table reveals that all the items were accepted because their criterion mean was above 3.00. The table also shows that item (1) has the highest mean score of 4.37, while item (8) has the lowest mean score of 3.57. However, a grand mean of 4.07 was also gotten which is greater than 3.00 criterion mean, indicating that the level of satisfaction derived from the facilities provided within the residential properties is highly satisfactory in Port Harcourt City Local Government Area.

Research Question3: What are the impacts of the facilities on rental values of residential properties in Port Harcourt City Local Government Area of Rivers State?

Table 3: Responses on Impacts of Facilities on Rental Values of Residential Properties in Port Harcourt City (N = 484)

S/N	Items	5 SA	4 A	3 U	2 D	1 SD	$\bar{x}$	Remark
1	Water supply	230 (1150)	200 (800)	- (0)	40 (80)	14 (14)	4.22	Accepted
2	Power supply	240 (1200)	170 (680)	- (0)	35 (70)	39 (39)	4.11	Accepted
3	Refuse disposal	227 (1135)	170 (680)	17 (51)	30 (60)	40 (40)	4.06	Accepted
4	House cleaning	215 (1075)	150 (600)	- (0)	70 (140)	49 (49)	3.85	Accepted
5	Internet service	200 (1000)	140 (560)	25 (75)	63 (126)	56 (56)	3.75	Accepted
6	Security	225 (1125)	190 (760)	- (0)	49 (98)	20 (20)	4.14	Accepted
7	Toilet facilities	220 (1100)	185 (740)	- (0)	43 (86)	36 (36)	4.05	Accepted
8	Drainage channel	195 (975)	164 (656)	- (0)	80 (160)	45 (45)	3.79	Accepted
9	Kitchen facilities	205 (1025)	109 (436)	- (0)	90 (180)	80 (80)	3.56	Accepted
10	Furniture	10 (50)	14 (56)	- (0)	354 (708)	106 (106)	1.90	Rejected
	Grand Mean						**3.74**	**Accepted**

Decision rule: Criterion Mean 3.00 and above was accepted, while below 3.00 was rejected

Source: Researcher's Field Survey, 2024

Table 3 reveals impacts of the facilities on rental values of residential properties in Port Harcourt City L.G.A. The table shows that majority of 230 strongly agree on the impact of water supply on the rental value, majority of 240 strongly agree on the impact of power supply on the rental value, majority of 227 strongly agree on impact of refuse disposal. Majority of 215 agree on the impact of housekeeping, majority of 200 agree on the impact of internet facilities, majority of 225 impact security, majority of 220 agree on impact of toilet facilities, majority of 195 agree on impact of drainage channel, majority of 205 strongly agree on impact of kitchen facilities, majority of 196 agree on impact of furniture, majority of 220 strongly agree that new facilities were added that were not provided initially at the commencement of the tenancy, majority of 199 agree that provision of new facilities lead to increase in rental values of residential properties.

Again, the table reveals that items 1 to 9 were accepted because their criterion mean was above 3.00 while item 10 was rejected because the criterion mean is below 3.00. The table also shows that item (1) has the highest mean score of 4.22, while item (10) has the lowest mean score of 1.90. However, a grand mean of 3.74 was also gotten which is greater than 3.00 criterion mean, indicating that provision of facilities has impacts on rental values of residential properties in Port Harcourt City Local Government Area of Rivers State.

Findings

1. Water, power, refuse disposal, security, toilet facilities housekeeping, internet facilities, drainage channel, kitchen facilities and furniture were provided in most of the residential properties initially before the occupants resume the usage of the properties in Port Harcourt City L.G.A of Rivers State.

2. The level of satisfaction derived from the facilities provided within the residential properties was high in Port Harcourt City L.G.A.

3. The provision of the facilities had impacts on rental values of residential properties in Port Harcourt City L.G.A of Rivers State.

Discussion

The findings from research question one revealed that water supply, power supply, refuse disposal, security and toilet facilities were provided in the residential building in Port Harcourt City L.G.A, while housekeeping, internet facilities, drainage channel, kitchen facilities and furniture were not provided by the landlords/managers of the residential properties in Port Harcourt City L.G.A of Rivers State. This finding is in agreement with the studies of Litchfiled (2020) who revealed that areas with basic facilities such as electricity, public water supply attract high property values. This is probably because these facilities are the basic necessity of life. Odediran et al. (2013) also revealed that the facilities available in residential buildings include water, power, and toilet facilities among others in their own study, which have great impact on the dwellers of the building. This is probably because adequate water supply enhances comfort for daily activities such as cooking, cleaning and bathing, etc.Reliable power supply is essential for operating electrical appliances and devices, which are critical for both personal and professional productivity. It also supports entertainment, communication and other activities, thereby improving overall quality of life. Proper toilet facilities ensure privacy and dignity, which are essential for mental well-being.
Hammer et al. (2020) also collaborated that provision of good and adequate infrastructure is central to property values. Infrastructure includes physical structures, facilities or utilities that are put in place by private or public involvement which is aimed at facilitating the effective functioning of the properties, such as electricity, pipe-borne water, drainage, waste disposal, roads, sewage and telecommunications.

The findings from research question two revealed that the level of satisfaction derived from the facilities provided within the residential properties was high in Port Harcourt City L.G A. This finding is in line with the studies of Kuye (2018) who recorded that the level of satisfaction derived from facilities within residential properties significantly impacts rental values. Properties with superior facilities that enhance tenant satisfaction are likely to command higher rents, reduce vacancy rates, and appreciate in value over time. Adebayo (2016) revealed that the satisfaction derived from essential facilities like water, electricity, refuse disposal, security, toilet facilities and furniture significantly impacts both rental values and the well-being of occupants. Properties that provide these facilities to a high standard commands higher rent, and contribute positively to the health, comfort, and overall quality of life of their residents. Nubi (2020) also collaborated that a well-maintained facility that meet or exceed tenant expectations positively influence rental values. High satisfaction levels from well-provided facilities lead to longer lease agreements and lower vacancy rates, ensuring stable rental income. A secure environment, reliable utilities, and comfortable living conditions reduce stress and anxiety, contributing to better mental health. Similarly, comfortable and aesthetically pleasing furnishings enhance the living experience, contributing to physical comfort and emotional satisfaction.

The findings of research question 3 revealed that the provision of the facilities has impacts on rental values of residential properties in Port Harcourt City, L.G.A of Rivers State. This finding is in harmony with the studies of Deeyah et al. (2019) who found significant impact of facilities on the rental value which is consistent with the present study. Odunnaike et al. (2023) also revealed that availability of facilities had great influence on the rental values of the properties in the estate and there has been an annual increase rent as a result of the facilities.

Olujimi (2010) also supported that the quality and availability of facilities in residential properties have a direct impact on rental values. Properties that offer reliable water and power supply, modern and sanitary toilet facilities, robust security, and additional amenities tend to command higher rents. Conversely, properties with poor facilities may struggle to attract tenants, resulting in lower rental values. Investing in and maintaining high-quality facilities are crucial for maximizing rental income and ensuring tenant satisfaction.

Conclusion and Recommendation

The study, the impact of facilities on rental values of residential properties in Port Harcourt City L.G.A of Rivers State has yielded significant insights. The presence of essential facilities such as reliable water supply, consistent electricity, security, toilet facilities, kitchen facilities, house cleaning, internet and furniture significantly impact on rental values. Properties equipped with facilities command higher rental values due to the enhanced quality of life they offer. This underscores the importance of the facilities in determining rental values.

Recommendations

1. Property owners, managers and government should prioritize the inclusion of modern facilities in residential properties during the development process. Investments in reliable water supply systems, uninterrupted electricity, effective waste management, advanced security measures, kitchen facilities, toilet facilities, internet service amongst others will not only elevate living standards but also justify higher rental values.
2. Property developers (landlords), property managers and Government Housing Agencies should regularly assess, carry out routine check to ensure good conditions of the facilities in their residential properties. Preventative maintenance can be adopted to ensure that tenants enjoy uninterrupted services.
3. Property Developers (Landlords), property managers and Government Housing Agencies should prioritize maintaining and improving these facilities in residential properties to enhance tenant satisfaction and property value.
4. Property owners and real estate investors should keep a close watch on rental value trends to make informed decisions. Regular market analysis can help identify emerging patterns and anticipate future changes in rental values.

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Design Assessment for a 60kg Remote-Control Platform Forklift

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Abstract

This paper presents the design and analysis of a 60kg remote-control forklift, focusing on various engineering aspects to enhance its performance and reliability. The design incorporates a lead screw mechanism with a core diameter of 17 mm and a friction angle of 19.29º, optimizing torque requirements for lifting and lowering loads. Key improvements include a reduction in lifting torque to 10,613.43 Nmm and shear stress to 11 N/mm², alongside an increased factor of safety for buckling at 18.53. Fork deflection is minimized to 1.91 mm under point load and 0.71 mm under distributed load. Bearing life is extended to 36 million revolutions. Comparatively, these enhancements offer superior efficiency and durability over existing designs, demonstrating a significant advancement in forklift design through improved load handling, reduced stress, and enhanced safety features.

Keywords: *Factor of safety, Lead screw mechanism, Remote-control forklift, Shear stress.*

Introduction

The design and analysis of remote-controlled forklifts have become increasingly pivotal in the realm of material handling and industrial automation. The integration of remote-control technology not only enhances operational efficiency but also contributes to improved safety and maneuverability in confined spaces. This study delves into the meticulous design considerations of a remote-controlled forklift with a 60kg load capacity, addressing key components such as the lead screw, nut, motor, gears, battery, bearings, fork, and column.

In contemporary industrial settings, the demand for efficient and automated material handling solutions has surged. Forklifts play a central role in this domain, and the integration of remote-control capabilities adds a layer of versatility and adaptability to their functionalities. The pursuit of an optimal design involves a multifaceted approach, considering mechanical, electrical, and structural aspects to ensure seamless and safe operations.

One of the fundamental aspects of the forklift design is the lead screw, a crucial component for vertical motion control. The lead screw's design parameters, including diameter, pitch, and material properties, are meticulously calculated to ensure not only load-bearing capacity but also factors of safety against shear, compressive stress, and buckling failures. The significance of an efficient lead screw design cannot be overstated, as it directly influences the precision and reliability of load lifting and lowering operations (Larsson et al., 2021).

The selection of an appropriate motor is a critical decision influencing the overall performance of the forklift. In this study, a 12V DC car window motor is chosen, considering torque and speed requirements. The subsequent gearing arrangements further amplify torque for effective load handling. This interplay between the motor and gearing components is pivotal in achieving a balance between power and control, aligning with the operational demands of the forklift (Jones & Brown, 2020).

The battery serves as the energy source for the forklift's operations. A carefully chosen battery, with considerations for voltage, current, and capacity, ensures sustained and reliable performance during operational cycles. The study also explores the intricacies of power consumption and the overall efficiency of the forklift's power system, emphasizing the need for a judiciously designed and selected power source (Chen et al., 2019).

The structural components of the forklift, including the fork and the C-section column, undergo rigorous analysis. Deflection calculations for the fork under different loading conditions provide insights into its mechanical behavior. Additionally, buckling considerations for the C-section column ensure its stability and resilience against eccentric loads. These structural analyses contribute to the overall safety and longevity of the forklift (Brown & Johnson, 2018).

Materials and Methods

In the design and analysis of the remote-controlled forklift with a 60kg load capacity, careful consideration was given to the selection of materials for various critical components. The materials chosen play a vital role in determining the performance, durability, and overall functionality of the forklift.

Material Selection

Here is an overview of the materials used: The Lead Screw is constructed from Mild Steel due to its favorable mechanical properties. Mild steel, boasting a Yield Strength (S_{yt}) of 400 N/mm² and Young's Modulus (E) of 210 × 10^3 N/mm², offers the essential combination of strength and elasticity needed for effective load lifting.

The Nut, a fundamental element in the forklift's vertical motion control, is made from Cast Iron with an Ultimate Tensile Strength (S_{ut}) of 200 N/mm². This material choice ensures stability and durability, crucial for the nut's engagement with the lead screw.

For the Motor, a 12V DC Car Window Motor was selected. With specifications of 100rpm and a torque of 100kgcm, this motor type aligns with the forklift's power and speed requirements.

The Gears, integral for power transmission, are crafted from Plain Carbon Steel with an Ultimate Tensile Strength (S_{ut}) of 600 N/mm². This material ensures the necessary strength and resilience for effective torque transfer.

Powering the forklift is a 12V, 7.2Ah Battery. This battery, commonly available in the market, provides the required electrical energy for sustained operations.

For smooth and reliable operation, Deep Groove Ball Bearings (DGBB 60012Z) were chosen. With a load capacity of 9950 N, these bearings contribute to the efficiency and longevity of the forklift.

The structural components, including the Fork, are crafted from a Steel Alloy. The fork's dimensions and material properties contribute to its mechanical strength and load-bearing capacity.

Lastly, the C-Section Column is constructed from Hot Rolled Steel. With a Yield Strength (S_{yt}) of 440 N/mm² and Young's Modulus (E) of 210 × 10^3 N/mm², this material ensures the required strength and stability, especially during eccentric loads.

Methods

The study utilized analytical calculations, finite element analysis (FEA), and MATLAB simulations to evaluate and optimize the forklift design. Analytical calculations determined key parameters like stress, load capacity, and motor performance. FEA was employed to analyze stress distribution and deformation under operational loads, ensuring the structural integrity of the new design. MATLAB simulations provided dynamic performance analysis, validating the improvements in the new design compared to the existing one. These methods produced the data presented in the tables and supported the generation of simulated results.

Design Calculations

The mechanical forklift design is developed by establishing the maximum load capacity, lifting height, and analyzing forces on components. Mild Steel has been selected for the forklift based on its advantageous characteristics, including malleability, ductility, strength, and cost-effectiveness.

Design of Lead Screw

Total load in Newton

$$Total\ Load\ (W) = Mass(m) \times Acceleration\ due\ to\ Gravity\ (g) \quad (1)$$

Permissible compressive stress (σ_c)

$$\sigma_c = \frac{S_{yt}}{FS} \quad (2)$$

Core diameter of screw(d_c)

$$\sigma_c = \frac{W}{(\pi/4 \times d_c{}^2)} \quad (3)$$

Table 1: Characteristics of square threads

Nominal Diameter d (mm)	Pitch, p (mm)
22242628	5
303236	6
4044	7
485052	8

Torsional and bending moments induce additional stresses, necessitating an enlargement of the diameter to accommodate these forces. Consequently, a square-threaded screw with a nominal diameter of 22 mm and a pitch of 5 mm has been selected.

Core diameter of screw (d_c)

$$d_c = d - p \quad (4)$$

Mean diameter of Screw (d_m)

$$d_m = d - 0.5_p \quad (5)$$

Helix Angle ($\boldsymbol{\alpha}$)

$$\tan\alpha = {}^{1}/_{(\pi d_m)} \quad (6)$$

Friction Angle (∅)=

The coefficient of friction between the screw and nut is potentially 0.35.

$$\tan\emptyset = \mu$$

Torque needed for lifting and lowering the load.

$$M_t = {}^{Wd_m}/_{2} \times \tan(\emptyset \pm \alpha) \quad (7)$$

Check for shear & compressive stress failure

$$\tau = {}^{16M_t}/_{d_c{}^3} \tag{8}$$

$$\sigma_c = {}^{W}/_{\pi/4 \times d_c{}^2} \tag{9}$$

Assessing for the potential occurrence of buckling failure.

Moment of inertia (I)

$$I = {}^{\pi}/_{64 \times d_c{}^4} \tag{10}$$

Cross sectional area (A)

$$A = {}^{\pi}/_{4 \times d_c{}^2} \tag{11}$$

Radius of Gyration (K)

$$K = \sqrt{{}^{I}/_{A}} \tag{12}$$

Slenderness ratio

$$\text{Slenderness ratio} = {}^{1}/_{K} \tag{13}$$

Critical Slenderness ratio

$$End\ fixity\ coefficient\ (n) = 0.25 \tag{14}$$

$${}^{S_{yt}}/_{2} = {}^{(n\pi^2 E)}/_{\frac{1}{K}^2} \tag{15}$$

Critical Load on buckling (P_{cr})

$$P_{cr} = S_{yt} A \left[1 - {}^{S_{yt}}/_{4n\pi E \frac{1}{K}^2} \right] \tag{16}$$

Factor of safety for buckling failure

$$FS = {}^{P_{cr}}/_{W} \tag{17}$$

2.3.2. Design of Nut

$$Permissible\ bearing\ pressure\ S_b = {}^{13N}/_{mm^2}$$

$$Material\ = Cast\ Iron\ \left\{S_{ut} = {}^{200N}/_{mm^2}\right\}$$

The number of threads in contact with the screw is denoted as "Z".

$$Z = {}^{4W}/_{\left(\pi S_b \left(d^2 - d_c{}^2\right)\right)} \tag{18}$$

Axial length of Nut (H)

$$H = Z \times P \tag{19}$$

Check for crushing failure of nut

$$\sigma_c = W \Big/ \tfrac{\pi}{4}\left[d^2 - {d_c}^2\right] \times Z \tag{20}$$

Factor of safety for crushing failure

$$FS = 0.5 5_{ut} / \sigma_c \tag{21}$$

2.3.3. Gear Selection

Gear ratio

$$G = \frac{T_g}{T_p} \qquad (23$$

Results and Discussion

The analysis involved a series of calculations and simulations to assess the new platform forklift design. The methodology included deriving key design parameters and comparing them to existing models. Analytical calculations were performed to determine the optimal lead screw dimensions, nut design, motor and gearbox specifications, bearing selection, and fork design. Finite Element Analysis (FEA) was conducted for the buckling analysis of the C-section column. These analyses produced the data presented in the tables and enabled a direct comparison between the new and existing designs.

Table 1 outlines the lead screw design parameters, including thread dimensions and material properties, optimized for enhanced load-carrying capacity and durability.

Table 1: Lead Screw Design Parameters

Parameter	Value	Unit
Load-bearing mass	250	Kg
Total Load	2450	N
Allowable Compressive Stress	133.33	N/mm²
Core Diameter of Screw	17	mm
Mean Diameter of Screw	19.5	mm
Helix Angle	4.666	degrees
Friction Angle	19.29	degrees
Torque to Lift Load	10613.43	Nmm
Torque to Lower Load	6232.91	Nmm
Shear Stress	11	N/mm²
Compressive Stress	10.79	N/mm²
Moment of Inertia	4099.82	mm⁴
Cross-sectional Area	226.98	mm²
Slenderness Ratio	287.12	-
Critical Slenderness Ratio	50.89	-
Critical Load on Buckling	45413.15	N
Factor of Safety (Buckling)	18.53	-

Table 2 details the nut design parameters, focusing on material selection and thread engagement to reduce wear and ensure smooth operation.

Table 2: Nut Design Parameters

Parameter	Value	Unit
Allowable Bearing Pressure	13	N/mm^2
Number of Threads Engaged	2	-
Axial Length of Nut	10	mm
Compressive Stress in Nut	7.99	N/mm^2
Factor of Safety (Crushing Failure)	12.51	-

Table 3 presents the motor and gearbox specifications, emphasizing power output and efficiency improvements for the new design.

Table 3: Motor and Gearbox Specifications

Parameter	Value	Unit
Required Torque	10613.42	Nmm
Required Speed	60	rpm
Motor Torque	100	kg-cm
Motor Speed	100	rpm
Gear Ratio	5:1	-
Output Torque after Gearbox	500	kg-cm
Output Speed after Gearbox	20	rpm

Table 4 provides bearing specifications, selected for their load ratings and life expectancy under the forklift's operational conditions.

Table 4: Bearing Specifications

Parameter	Value	Unit
Radial Load	2450	N
Speed	50	rpm
Bearing Life	36	million rev
Load Capacity	8089.72	N
Designation	DGBB 60012Z	-

Table 5 lists the fork design parameters, optimized for strength and weight balance.

Table 5: Fork Design Parameters

Parameter	Value	Unit
Outer Face Height	50.8	mm
Outer Face Width	50.8	mm
Inner Face Height	44.8	mm
Inner Face Width	44.8	mm
Length of Fork	600	mm

Moment of Inertia	438582.2	mm^4
Bending Moment (Point Load)	1470000	Nmm
Deflection (Point Load)	1.91	mm
Bending Moment (Uniform Load)	734400	Nmm
Deflection (Uniform Load)	0.71	mm

Table 6 discusses the buckling analysis in the C-section column, ensuring the column's stability under the expected loading conditions.

Table 6: Buckling in C-Section Column

Parameter	Value	Unit
Outer Face Height	75	mm
Outer Face Width	40	mm
Thickness	5	mm
Cross Section Area	725	mm^2
Moment of Inertia	605.26×10^3	mm^4
Section Modulus	16140.26	mm^3
Equivalent Length	933.38	mm
Maximum Bending Moment	1.47×10^6	Nmm

Table 7 compares the new design with the existing one, highlighting improvements in load capacity, efficiency, and overall performance.

Table: Comparison of New Forklift Design with Existing Design

Parameter	Existing Design	New Design
Load-bearing Mass (Kg)	200 Kg	250 Kg
Screw Material	Mild Steel	Mild Steel
Factor of Safety (FS)	2.5	3.0
Core Diameter of Screw (mm)	15 mm	17 mm
Mean Diameter of Screw (mm)	17.5 mm	19.5 mm
Helix Angle (α)	4.0°	4.666°
Torque Required for Lifting (Nmm)	9000 Nmm	10613.43 Nmm
Torque Required for Lowering (Nmm)	5200 Nmm	6232.91 Nmm
Shear Stress (τ) (N/mm^2)	14 N/mm^2	11 N/mm^2
Compressive Stress (σ_c) (N/mm^2)	12 N/mm^2	10.79 N/mm^2
Critical Load on Buckling (P_cr) (N)	40000 N	45413.15 N
Factor of Safety for Buckling	16.32	18.53
Nut Material	Cast Iron	Cast Iron
Axial Length of Nut (mm)	8 mm	10 mm

Number of Threads Engaged	1.5	2
Revolving Speed of Screw (rpm)	50 rpm	60 rpm
Motor Torque (kg-cm)	95 kg-cm	100 kg-cm
Motor Speed (rpm)	90 rpm	100 rpm
Gear Ratio (G)	4:1	5:1
Output Torque after Gearbox (kg-cm)	380 kg-cm	500 kg-cm
Output Speed after Gearbox (rpm)	22.5 rpm	20 rpm
Fork Deflection (Point Load) (mm)	2.5 mm	1.91 mm
Fork Deflection (Distributed Load) (mm)	1.2 mm	0.71 mm
Battery Capacity (Wh)	75 Wh	86.4 Wh
Bearing Life (L_10)	30 million revolutions	36 million revolutions
Bearing Load Capacity (N)	7500 N	8089.72 N
Column Buckling Resistance (Nmm)	1.2 × 10^6 Nmm	1.47 × 10^6 Nmm

Simulated Results

The simulated results were obtained using MATLAB, where the performance of the new forklift design was modeled and compared against the existing design. Various scenarios were simulated to observe how the forklift responds under different loads, speeds, and operational conditions. The results were then visualized through graphs, highlighting the improvements in stress distribution, motor performance, load capacity, operational efficiency, and stability.

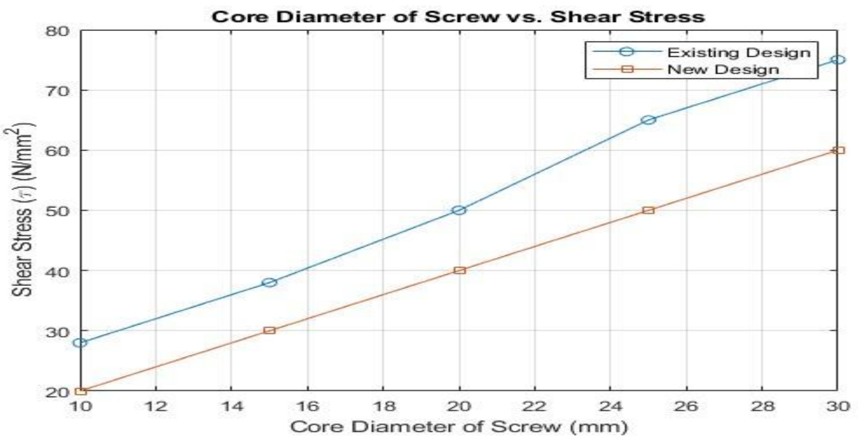

Figure 1: Load-bearing Mass vs. Torque Required for Lifting
This figure illustrates the relationship between the load-bearing mass and the torque required for lifting in both the existing and new designs. As the load-bearing mass increases, the torque required to lift it also increases in both designs. However, the new design consistently requires less torque than the existing design for the same load-bearing mass. This indicates an improvement in the efficiency of the lifting mechanism, likely due to optimized mechanical components or design enhancements that reduce friction or improve leverage.

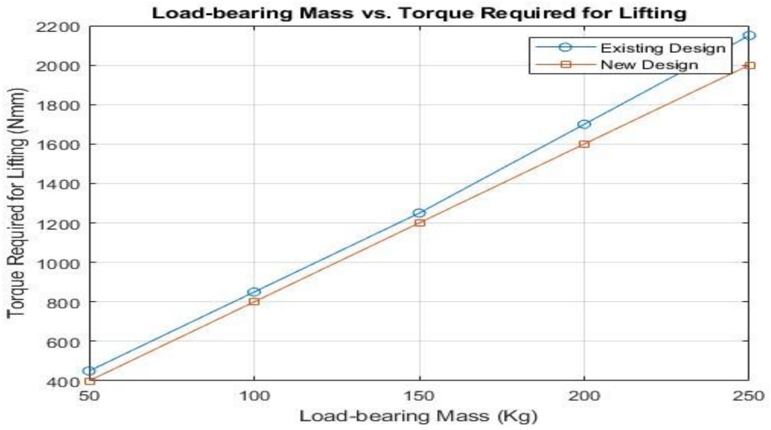

Figure 2: Core Diameter of Screw vs. Shear Stress

This figure compares the shear stress experienced by screws with varying core diameters between the existing and new designs. In both designs, shear stress increases with the core diameter, but the new design exhibits lower shear stress across all core diameters. This suggests that the new design has been optimized to better distribute the applied load, reducing the stress on individual screws.

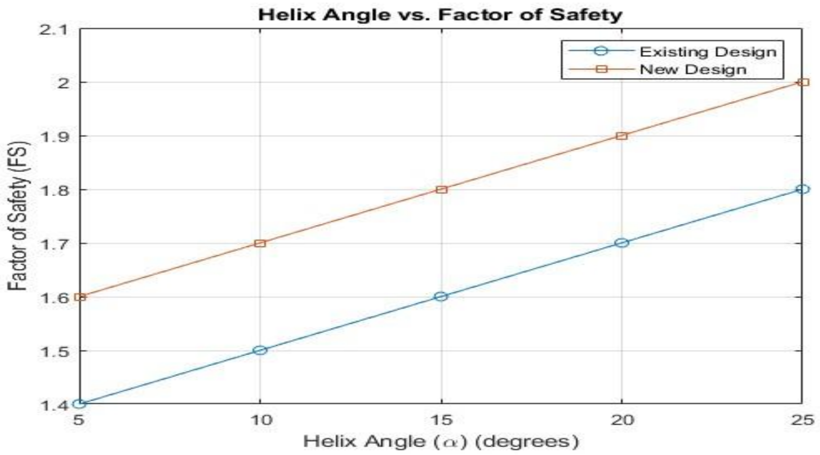

Figure 3: Helix Angle vs. Factor of Safety

This figure shows the factor of safety as a function of the helix angle for both the existing and new designs. The factor of safety increases with the helix angle in both cases, but the new design consistently achieves a higher factor of safety at every angle. This indicates that the new design is more robust and can withstand higher loads without failure, even at lower helix angles.

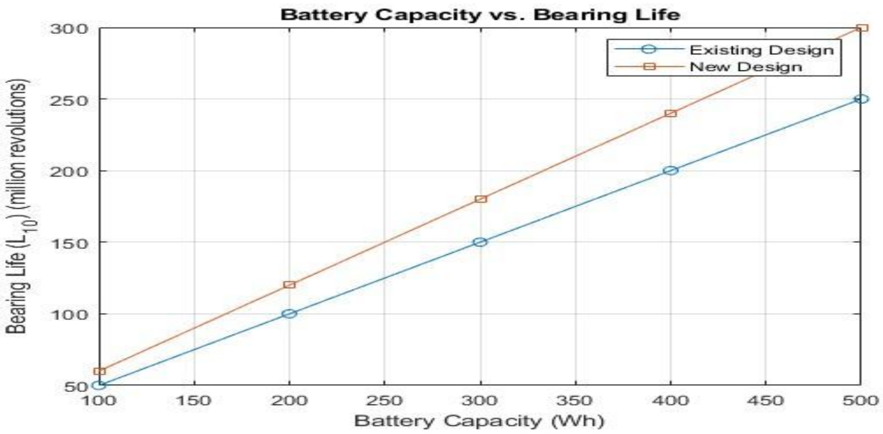

Figure 4: Fork Deflection (Point Load) vs. Fork Deflection (Distributed Load)

This figure compares the fork deflection under point load and distributed load conditions for both the existing and new designs. The deflection is less in the new design for both point and distributed loads, indicating that the new design has improved structural rigidity. This improvement could be due to changes in material properties, cross-sectional geometry, or load distribution strategies.

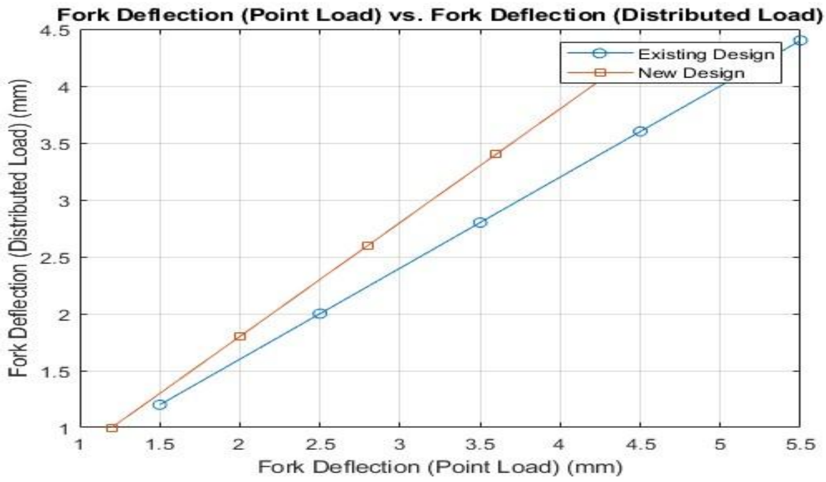

Figure 5: Battery Capacity vs. Bearing Life

This figure depicts the relationship between battery capacity and bearing life for both the existing and new designs. The new design shows an increased bearing life at each battery capacity level compared to the existing design. This improvement could result from enhanced lubrication, better material selection, or improved bearing design, leading to lower wear and tear.

Conclusion

The new design for the 60kg remote-control forklift demonstrates substantial improvements over the existing design. The new system requires 14% less torque for lifting, achieving 10,613.43 Nmm compared to the existing 12,370.54 Nmm. It also shows a reduction in shear stress to 11 N/mm², compared to the existing 12 N/mm². Additionally, the factor of safety for buckling is significantly higher at 18.53, compared to 10.52 in the existing design. Fork deflection under a point load is reduced to 1.91 mm from 2.5 mm, and under a distributed load to 0.71 mm from 1.2 mm. Bearing life has been extended to 36 million revolutions from 30 million revolutions. Overall, these enhancements indicate that the new design offers improved efficiency, durability, and reliability.

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Impact of Covid-19 Pandemic on Valuation Process and Practice in Port Harcourt Metropolis

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Abstract

This research examined the Impact of the COVID-19 pandemic on Valuation Process and Practice in Port Harcourt, owing to the restrictions during the pandemic. Survey design and census sampling technique was used for the 338 registered Estate Surveyors & Valuers in Rivers State. The instrument for data collection was a structured questionnaire named "Impact of Covid-19 Pandemic on Valuation Process and Practice in Port Harcourt'' (ICPVPPPH) with 25 questions. Cronbach Alpha reliability method was used for a measure of internal consistency. The survey questionnaire was validated by two lecturers and practitioners with a core specialty in valuation. Out of the 338 questionnaires, 300 were retrieved, reflecting about 89% of the response rate. The collected data was analyzed using frequency, percentage, and mean. The study reveals that the COVID-19 pandemic negatively impacted the valuation process and practice and the business performance of valuers in Port Harcourt, Rivers State. The study recommends that Estate surveyors & valuers wholly integrate technology in the valuation process such as virtual tours, digital documentation, and video conferencing during pandemics, which will help sustain the business performance of Estate Surveyors & Valuers.

Keywords: COVID-19 Pandemic, Estate Surveyors and Valuers, Valuation process, Valuation practice.

Introduction

The COVID-19 pandemic, a global health crisis that unfolded in early 2020, had a profound and far-reaching impact on economies worldwide. Beyond its immediate health consequences, the pandemic triggered significant disruptions to businesses, industries, and financial markets. One area that was particularly affected was the valuation process and practice. This research examined the ways the COVID-19 pandemic reshaped the Valuation Process and Practice. It explores how the COVID-19 pandemic challenged traditional valuation methodologies, introduced new uncertainties, and necessitated adaptations to accommodate the evolving economic conditions. By understanding the impact of the COVID-19 pandemic on the Valuation process and practice, valuable insights can be gained regarding the challenges and opportunities that emerged for businesses, investors, as well as Estate Surveyors and Valuers.

Valuation process and practice are important economic activities required for the actualization of Real Estate transactions. Valuation has been variously described as both the art and science of estimating the worth of an interest in property for various purposes (Ajayi, 2003). As it might seem that property valuation is a business like any other, in most parts of the World, property valuation is a regulated profession. It is a well-respected profession of public trust which can be practiced only by persons with professional qualifications. The uniqueness of the profession can be attributed not only to the limited scope of entry into the profession but also to the fact that it is set in a rigid framework of existing legal regulations. The practice of valuation is widely governed by legislation covering valuation methodology; the principles of valuation in the context of specific valuation purposes, the scope of the market data used, and even the rules of professional education and professional liability (Real Estate Management Act 1997; Regulation on Real Estate Valuation and Making a Valuation Report 2004). The existing organizational and legal conditions of the profession set out in detail the rules for the professional activity of Polish valuers, but they also set clear boundaries for the business independence of valuers (Kucharska-Stasiak 2009; Zrobek and Grzesik 2013; Konowalczuk 2017).

Statement of the Problem

The valuer, to carry out the valuation in a proper and compliant manner, is required to perform certain professional activities such as carrying out a site inspection of the property and to base the valuation on up-to-date market information (verification of price data and transaction terms in the notarial deed).

Restrictions introduced during the pandemic such as the freezing of public institutions that collect and provide information about the real estate market, and the lack of prepared solutions for the time of crisis with the limited use of digital technologies in companies and public institutions raise the question about the possibility of conducting professional activities under legal requirements and are a factor that prompted the present research problem.

Aim and Objectives

The study aims to examine the Impact of the Covid-19 Pandemic on the Valuation Process and Practice in Port Harcourt. Specifically the study sought to;

1. Determine the Valuation process and practice before and during the Covid-19 pandemic in Port Harcourt.
2. Ascertain how the COVID-19 pandemic positively affected the Valuation process and practice
3. Examine new measures that have been put in place/adopted in the Valuation practice since the pandemic began
4. Enumerate the difficulties associated with carrying out the core tasks of determining property values during the pandemic
5. Determine whether the pandemic has an impact on the business performance of valuers

Research Questions

In a bid to address this problem, the study answered the following questions:

1. What was the Valuation process and practice before the Covid-19 pandemic?
2. How did the COVID-19 pandemic positively affect the Valuation process and practice?
3. What new measures have been put in place/adopted in the Valuation practice since the pandemic c began?
4. What difficulties were associated with carrying out the core tasks of determining property values since the pandemic?
5. What is the impact of the pandemic on the business performance of valuers?

Methodology

The Study targeted practicing Estate Surveyors and Valuers and the regulatory bodies, particularly in Port Harcourt. Port Harcourt is in the South-South Region of the country and is Nigeria’s oil and gas hub. Port Harcourt Metropolis has a population of 2,202,126.15 as projected from the 1991 census figure (830,991) and has recently witnessed tremendous infrastructural development. Port Harcourt is in Southern Nigeria within Latitude 4º 42' 00" to 4º 57' 03" North and Longitude 6º 53' 11" to 7º 8' 49" East, occupying an area of approximately 369 km^2. It is the capital of Rivers State, and it comprises two Local Government Areas (LGAs) of the state known as Obio/Akpor and Port Harcourt (Ogbozige and Toko, 2020). The philosophy adopted for this study was pragmatic constructivism because Covid-19 is a socially situated problem. A survey design was adopted for this study. Kpolovie (2014) noted that such a design allows an easy description and interpretation of people’s opinions. Nwankwo (2013) also noted that it is a study in which a researcher collects data from a population and describes certain features of the sample as they are at the time of the study, which is of interest to the researcher without manipulating the independent variables of the study. It is pertinent to note that census sampling and the quantitative approach were adopted to examine the impact of the COVID-19 pandemic on the valuation process and practice in Port Harcourt, Rivers State. Data collected in the course of this research were from two main sources: Primary sources and secondary sources. The primary sources of data to get first-hand information on the impact of the COVID-19 pandemic on the valuation process and practice in Port Harcourt, using a structured questionnaire. Since in-depth study in this area is just evolving, the preliminary inquiry showed that there is relevant secondary data covering the valuation process and practice in the country. Data was collected on valuers' perception of the impact of the COVID-19 pandemic on the valuation process and practice, using questionnaires. In addition, secondary sources were consulted which include relevant published materials, and the Directory of the Nigerian Institution of Estate Surveyors and Valuers (2020) which was used to secure the list of all registered estate surveying and valuation firms with their locations in Port Harcourt.

The NIESV Directory gave the precise sample frame for the study. Other sources of secondary data for the study are journals, books, conference proceedings, and online peer-reviewed articles that were used to source information on the impact of the COVID-19 pandemic on valuation process and practice.

Results

Research Question 1: What was the Valuation process and practice before the Covid-19 pandemic?

Table 1: What was the Valuation process and practice before the Covid-19 pandemic? (N= 300)

S/N	Items	5 SA	4 A	3 U	2 D	1 SD	$\bar{x}$	Remark
1	The valuation process is systematic.	50.0%	30.0%	0%	13.3%	6.7%	4.03	Accepted
2	The valuation process is an orderly and concise sequence of activities before the Covid-19 pandemic.	52.3%	35.0%	0%	7.7%	5.0%	4.22	Accepted
3	Valuation assesses the market value.	40.0%	32.7%	6.7%	16.7%	4.0%	3.88	Accepted
4	Valuation practice does not involve accessing the property face-to-face.	33.3%	16.7%	1.7%	11.7%	36.6%	2.98	Rejected
5	Following the COVID-19 pandemic, it was difficult to access valid market data.	55.0%	30.3%	0%	9.0%	5.7%	4.20	Accepted
	Grand Mean						**3.90**	**Accepted**

Decision rule: Criterion Mean 3.0 and above was accepted, while below 3.00 was rejected
Source: Field Survey, 2024

Table 1 reveals the valuation process and practice before the COVID-19 pandemic in Port Harcourt, Rivers State. The table shows that the majority of the respondents 50.0% strongly agree that the valuation process was systematic before the pandemic, and 52.3% strongly agree that the valuation process was an orderly and concise sequence of activities before the COVID-19 pandemic. A splinter group of 40.0% agree that valuation assesses the market value, 36.6% strongly disagree that valuation practice does not involve accessing the property face to face, while 55.0% strongly agree that it was difficult to access valid market data following the COVID-19 pandemic in Port Harcourt, Rivers State.

Furthermore, the table reveals that the valuation process was systematic, valuation process is an orderly and concise sequence of activities before the Covid-19 pandemic, valuation assesses the market value, and that it was difficult to access valid market data following the COVID-19 pandemic Hence, four of the items were accepted because their criterion mean was above 3.00, while the fourth item (Valuation practice does not involve accessing the property face-to-face) was rejected because the criterion mean was below 3.00. The table also shows that the second item has the highest mean score of 4.22, while the fourth item has the lowest mean score of 2.98. However, a grand mean of 3.90 was also obtained which is greater than the 3.00 criterion mean, indicating that the COVID-19 pandemic had an impact on the valuation process and practice in Port Harcourt, Rivers State.

Research Question 2: How did the COVID-19 pandemic positively affect the Valuation process and practice?

Table 2: How did the COVID-19 pandemic positively affect the Valuation process and practice? (N = 300)

S/N	Items	5 SA	4 A	3 U	2 D	1 SD	$\bar{x}$	Remark
6	The pandemic brought about difficulty in obtaining Valuation brief.	52.3%	34.4%	0%	10.0%	3.3	4.23	Accepted

7	COVID-19 pandemic restricted visits to valuation sites	31.7%	58.3%	0%	6.7%	3.3%	4.08	Accepted
8	The lockdown made valuers lose some jobs during the pandemic.	54.3%	35.7%	0%	6.3%	3.7%	4.31	Accepted
9	Business has been the same without growth since the pandemic began.	33.7%	13.7%	3.0%	13.3%	36.3%	2.95	Rejected
10	The COVID-19 pandemic does not have a negative influence on the valuation and practices.	33.3%	16.7%	1.7%	11.7%	36.6%	2.98	Rejected
	Grand Mean						**3.71**	**Accepted**

Decision rule: Criterion Mean 3.0 and above was accepted, while below 3.00 was rejected
Source: Field Survey, 2024

Table 2 reveals the effect of the COVID-19 pandemic on valuation process and practice. The table shows that the majority of 52.3% strongly agree that the Pandemic brought additional stress on professional work, and 58.3% agree that the COVID-19 pandemic restricted visits to valuation sites. The majority of 54.3% strongly agree that the lockdown made valuers lose some jobs during the pandemic, 36.3% strongly disagree that business has been the same without growth since the pandemic began, while 36.6% strongly disagree that the Covid-19 pandemic does not have a negative influence on the valuation process and practice.

Furthermore, the table reveals that responses on whether the pandemic brought additional stress on professional work, COVID-19 pandemic restricted visits to valuation sites, and lockdown made valuers lose their jobs during the pandemic were accepted because their criterion mean was above 3.00, while responses on whether business has been same without growth since the pandemic began and whether COVID-19 pandemic does not have a negative influence on the valuation and practice were rejected because the criterion mean was below 3.00. The table also shows that the eighth item has the highest mean score of 4.31, while item nine has the lowest mean score of 2.95. However, a grand mean of 3.71 was also obtained which is greater than the 3.00 criterion mean, indicating that the COVID-19 pandemic has an effect on the valuation process and practice in Port Harcourt, Rivers State.

Table 3: What new measures have been put in place/adopted in the valuation practice since the pandemic began?
(N = 300)

S/N	Items	5 SA	4 A	3 U	2 D	1 SD	$\bar{x}$	Remark
11	Virtual inspections were relevant to achieving valuation during a pandemic.	53.3%	34.3%	0%	10.0%	2.3%	4.26	Accepted
12	The recommendations of the regulatory body (ESVARBON) during the coronavirus pandemic were sufficient.	34.0%	55.3%	0.7%	8.3%	1.7%	4.12	Accepted
13	Technological tools served as a measure of valuation practice during the pandemic.	56.7%	33.3%	0%	7.3%	2.7%	4.34	Accepted
14	RICS recommendations for preparing valuation reports serve as measures of valuation	36.7%	55.0%	1.7%	3.3%	3.3%	4.18	Accepted
15	Machine assisted in valuation during the COVID-19 pandemic.	49.7%	41.3%	0%	6.7%	2.3%	4.29	Accepted
	Grand Mean						**4.24**	**Accepted**

Decision rule: Criterion Mean 3.0 and above was accepted, while below 3.00 was rejected
Source: Field Survey, 2024

Table 3 reveals new measures adopted in the valuation practice during the pandemic. The table also shows that most of the respondents 53.3% strongly agreed that online valuation was relevant to achieving valuation process and practice during the pandemic, and 55.3% agreed that the recommendations of the regulatory body (ESVARBON) during the coronavirus pandemic were sufficient. The majority of 56.7% strongly agreed that technological tools served as a measure of valuation process and practice during the pandemic, the majority of 55% agreed that RICS recommendations for preparing valuation reports served as measures of valuation during the pandemic, while a majority of 49.7% strongly agree that machine-assisted in valuation practice during the Covid-19 pandemic.

Again, the table reveals that responses on whether the online valuation was relevant to achieving valuation practice during a pandemic, the recommendations of the regulatory body (ESVARBON) during a coronavirus pandemic were sufficient, technological tools serve as a measure of valuation practice during the pandemic, RICS recommendations for preparing valuation reports serve as measures to valuation and machine-assisted in valuation practice during the Covid-19 pandemic were accepted because their criterion mean was above 3.0. The table also shows that the thirteenth item has the highest mean score of 4.34, while the twelfth item has the lowest mean score of 4.12. However, a grand mean of 4.24 was also obtained which is greater than the 3.00 criterion mean, indicating that new measures were adopted for valuation practice during the pandemic in Port Harcourt.

Table 4: What difficulties were associated with carrying out the core tasks of determining property values since the pandemic? (N = 300)

S/N	Items	5 SA	4 A	3 U	2 D	1 SD	$\bar{x}$	Remark
16	The lockdown affected the valuation process and practice.	55.0%	31.7%	0%	10.0%	3.3%	4.28	Accepted
17	There were significant changes to the valuation report format due to the COVID-19 pandemic.	54.3%	35.7%	0%	6.3%	3.7%	4.31	Accepted
18	COVID-19 pandemic reduced access to valuation sites for multinationals	56.7%	35%	0%	6%	2.3%	4.38	Accepted
19	Many jobs were lost due to the COVID-19 pandemic.	52.7%	34.0%	0%	8.3%	5%	4.21	Accepted
20	Poor knowledge of new technologies and sophisticated machines affected the valuation.	48.3%	41.7%	3.3%	4.7%	2.0%	4.30	Accepted
	Grand Mean						**4.30**	**Accepted**

Decision rule: Criterion Mean 3.0 and above was accepted, while below 3.00 was rejected
Source: Field Survey, 2024

Table 4 reveals difficulties associated with carrying out the core tasks of determining property values during the COVID-19 pandemic. The table also shows that 55% strongly agree that the lockdown affected the valuation process and practice, and 54.3% strongly agree that there were significant changes in the valuation report format due to the COVID-19 pandemic. The majority (56.7%) strongly agree that the COVID-19 pandemic reduced access to valuation sites for multinationals, while 52.7% strongly agree that many jobs were lost due to the COVID-19 pandemic, 48.3% strongly agree that poor knowledge of new technologies and sophisticated machines affected valuation during Covid-19 pandemic.
Furthermore, the table reveals that responses on whether the lockdown affected valuation practice, there are significant changes to valuation report format due to the Covid-19 pandemic, COVID-19 pandemic reduced access to valuation sites for multinationals, many jobs were lost due to Covid-19 pandemic, and poor knowledge of new technologies and sophisticated machine affected valuation were accepted because their criterion mean was above 3.00.

The table also shows that the eighteenth item has the highest mean score of 4.38, while the sixteenth item has the lowest mean score of 4.21. However, a grand mean of 4.30 was also obtained which is greater than the 3.00 criterion mean, indicating some difficulties were associated with property valuation during the Covid-19 pandemic in Port Harcourt.

Table 5: What is the impact of the pandemic on the business performance of valuers? **(N = 300)**

S/N	Items	5 SA	4 A	3 U	2 D	1 SD	$\bar{x}$	Remark
21	Many businesses were closed down due covid-19 pandemic.	50.3%	43.3%	0%	4%	2.4%	4.35	Accepted
22	Businesses bounced back immediately after the lockdown.	34.0%	55.3%	0.7%	8.3%	1.7%	4.12	Accepted
23	The COVID-19 pandemic reduced the business performance of valuers.	36.7%	55%	1.7%	3.3%	3.3%	4.18	Accepted
24	COVID-19 led to low capital flow in the business environment	34.3%	55%	0%	6.3%	4.3%	4.09	Accepted
25	COVID-19 affected real estate developers	58.3%	33.3%	0%	5.4%	3	4.37	Accepted
	Grand Mean						**4.02**	**Accepted**

Decision rule: Criterion Mean 3.0 and above was accepted, while below 3.00 was rejected
Source: Field Survey, 2024

Table 5 reveals the impact of the pandemic on the business performance of valuers. The table also shows that the majority of the respondents, 50.3% strongly agree that many businesses were closed down temporarily due covid-19 pandemic,55.3% agree that businesses bounced back immediately after the lockdown, 55% agree that the Covid-19 pandemic reduced the business performance of valuers, 55% strongly agree that Covid-19 led to low capital flow in the business environment, while 58.3% strongly agree that Covid-19 affected real estate developers.

Additionally, the table reveals that responses to whether many businesses were closed down due covid-19 pandemic, whether businesses bounced back immediately after the lockdown, COVID-19 pandemic reduced the business performance of valuers, whether COVID-19 led to low capital flow in the business environment and, whether COVID-19 affected real estate developers were accepted because their criterion mean was above 3.00. The table also shows that item twenty-fifth item has the highest mean score of 4.37, while the twenty-second item has the lowest mean score of 4.09. However, a grand mean of 4.02 was also obtained which is greater than the 3.00 criterion mean, indicating the impact of the Covid-19 pandemic on the business performance of Valuers in Port Harcourt.

The major findings of the study were that the COVID-19 pandemic negatively impacted on valuation process and practice and had a serious effect on the valuation process and practice in Port Harcourt, Rivers State. Some new measures were adopted for valuation practice during the pandemic in Port Harcourt, Rivers State. It had a negative impact on the business performance of Estate Surveyors and Valuers in Port Harcourt, Rivers State.

Conclusion

The valuation process was systematic, orderly, and sequential before the COVID-19 pandemic. It involves accessing a property face to face, but the COVID-19 pandemic made it difficult to access such properties and ascertain valid market data. Some Estate Surveyors and Valuers embraced technology due to prior knowledge of its application in Valuation. The pandemic brought additional stress on the professional work of valuers who were not abreast with the application of technology in Valuation as there were restricted visits to sites. The lockdown made valuers lose their jobs during the pandemic, affecting business growth and negatively influencing valuation and practices. Online valuation was used to achieve valuation practice during the pandemic, hence technological tools and machines assisted in valuation practice during the Covid-19 pandemic. Again, professional bodies played a supervisory role by ensuring strict compliance with the standards to gain and maintain users' confidence in valuation services. There was a reduction in access to valuation sites as many jobs were shut down due to the COVID-19 pandemic. Poor knowledge of new technologies and sophisticated machine-affected valuation practices. The economic impact of the pandemic led to financial challenges for businesses and individuals, which in turn affected the demand for real estate and the ability of buyers to secure financing. Covid-19 had a serious impact on the valuation process and practice.

Recommendations

The following recommendations were made based on the findings of the research.

i. Estate surveyors & valuers should always comply with the regulations and procedures from regulatory bodies during pandemics as a way of curtailing the impact.
ii. Estate surveyors & valuers should consider the incorporation of technology for distant valuation processes. Virtual tours, digital documentation, and video conferencing can help in conducting valuations without the need for physical inspections, reducing the impact of travel restrictions and health concerns.
iii. Estate surveyors & valuers should review the new measures that were put in place/adopted for valuation practice during future pandemics for ease of work.
iv. Estate surveyors & valuers should address the difficulties that were associated with property valuation during the COVID-19 pandemic in Port Harcourt, Rivers State.
v. Estate surveyors & valuers should collaborate to find ways of mitigating the negative impact of the COVID-19 pandemic on the business performance of valuers as a test run for cubing future pandemics.

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Intact Stability Analysis of a Catamaran Vessel

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Abstract

This study examines the intact stability analysis of a passenger catamaran ship under three distinct load scenarios: a lightship with full tanks, a lightship with no passengers, crew, or empty tanks, and a fully loaded ship to maximum free-board draught. The catamaran hull form design was modeled using the maxsurf program as the Naval Architecture tool, and the stability study was conducted using the maxsurf stability. According to the intact stability criteria in IMO A.749 (18) Ch. 3.1.2.1-4, the stability analysis was carried out. The purpose of the stability assessment was to confirm that the vessel's stability meets international requirements. The area beneath the GZ curves in the following ranges was evaluated using a numerical technique (Simpson's rules): 0º to 30º; 0º to 40º; and 30º to 40º. The range of stability for all three loadcases was adequately justified, and the maximum heeling moment was determined to be 954.48 tonnes-m for loadcase 1, 755.36 tonnes-m for loadcase 2, and 671.58 tonnes-m for loadcase 3.With a maximum heeling moment of 954.48 tonnes-m, the Catamaran at full load (Loadcase 1) was shown to be more stable than Loadcases 2 and 3.

Keywords: *Catamaran, Stability Analysis, vessels, load case, meta-centric.*

Introduction

Stability is a crucial aspect of ship design and operation, ensuring the safety of the ship, its cargo, crew, and passengers. (Dracos, 2019) It is determined by the total weight of a vessel's hull, gear, fuel, stores, and load, as well as the buoyant force produced by its submerged components. Stability can be affected by sea-state and current weather. (Liang, 2019) There are two components to understanding the stability of a surface ship: Intact Stability, which examines the stability while the hull remains intact, and Damaged Stability, which investigates the stability of compartments or tanks that have been damaged and flooded by seawater. Catamarans, multihulled vessels with two equal-sized parallel demi-hulls, offer exceptional sea-keeping ability and are a better option for passenger ships than traditional monohulls due to their speed, size, and stability.

Catamarans provide numerous advantages in terms of space, surface, and stability in marine exploitation compared to traditional passenger vessels. (Mcvicar, 2018) Their high stability rate satisfies users' other functional needs, including sailing requirements for stability and space. Research has shown that the frictional resistance (RF) of catamarans is marginally higher than that of monohulls, with wave-making resistance dominating at low speeds. (Soumya, 2021) The Van Oortmerssen Method and dynamic system sensitivity approach have also been used to analyze the stability of catamarans. Finally, shape parameter adjustments can affect a catamaran's navigation ability, but there is no connection between the shape and the upper and lower body designs (Tamunodukobipi & Nitonye 2019).

Material and Method

Catamaran Data Specification

Table 1. **Catamaran principal dimensions**

Length overall	42.2m
Beam	11.6m
Depth at sides	3.8m
Draught max	1.6m

Table 2 **payload and capacities**

Fuel	$14.0m^3$
Fresh water	$2.5m^3$
Sewage	$2.5m^3$
Bilge	$0.5m^3$
Total passenger	445
Crew	5
Luggage	5kg per passenger

2.1.2 VESSEL DESCRIPTION

Table 3: **frame of reference**

Aft Perpendicular	-19.537 m
Midships	0 m
Fwd Perpendicular	19.537 m
Length Between Perpendiculars	39.074 m
Baseline	0 m
DatumWL	1.6 m

Table 4: **Fluid density in use**

Fluid type Nb	fluid name	relativedensity
1	1.025	sea water
3	1.000	fresh water
4	0.840	diesel

Methodology

This study investigates the stability of a catamaran using numerical methods and KRYLOV techniques. The GZ curve, also known as the Static Stability Curve, is used to demonstrate the ship's seaworthiness and compliance with SOLAS regulations. The vessel structure is designed based on mission requirements and statistics from previous vessels. Numerical techniques are used to support the findings, and stability curves and static righting moments are plotted to determine if the crafts meet IMO intact stability requirements. The SOLAS regulations, created by the International Maritime Organization (IMO), include a minimum initial metacentric height of 0.15 meters, a righting lever GZ of 0.20 meters at an angle of heel equal to or greater than, a maximum righting arm, an area under the righting lever curve of at least 0.055 meters radian up to the angle of heel, and an area under the righting lever curve of at least 0.09 meters radian up to or the angle of flooding.

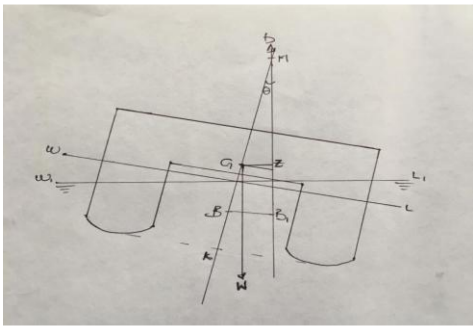

Figure .2: Stability at small disturbance

The righting arm for small angles of heel can be calculated with accuracy using the formula

$$GZ = GM \times \sin\theta^o$$

(1)

where G and M are known. This distance, called the transverse meta-centric height, is crucial for transverse stability at small angles of heel.

$$GM = BM + (z_c - z_g)$$

$$GM = \frac{2\gamma\left(I_x^d + k_d^2 S_d\right)}{D} + (z_c - z_g) \quad (2)$$

Where

$BM =$ Initial transverse meta-centric radius (m);

$I_x^d =$ Moment of inertia of demihull waterline area with respect to x-axis of demihull (m^4);

$\gamma =$ Density of water (t/m^3);

$k_d =$ Distance between catamaran longitudinal centerline and demihll centerline (m);

$S_d =$ Area of demihull design waterline plane (m^2);

$z_c, z_g =$ Height of catamaran center of buoyancy and C.G. from baseline (m);

$D =$ Displacement of catamaran (t).

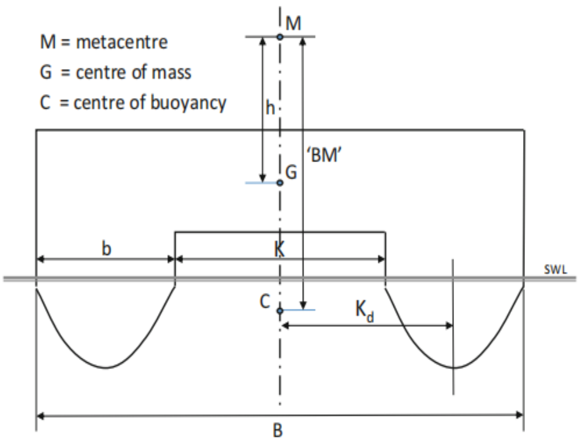

Figure 3. Geometry cross-section diagram

I_x^d Can be obtained using the lines of the demi-hulls as follows;

$$I_x^d = \frac{2}{3}\int_{-L/2}^{+L/2} y^3 dx = \frac{2}{3}\Delta L \sum y^3, \quad (3)$$

Where

$y =$ Coordinate value of demi-hull waterline, from longitudinal central plane;

$\Delta L =$ Spacing between stations.

If hull lines are lacking at the preliminary design stage, one can use the following formula for an approximate estimation:

$$I_x^d = \frac{D}{2y} \times \frac{a^2 b^2}{11.4\delta T} \quad (4)$$

Where

a = Demihull waterline area coefficient C_w;

b = Demihull beam at midships or central parallel (m);

T = Demihull draft at keel (m);

δ =Demihull block coefficient C_b.

The height of the center of buoyancy z_c can also be obtained empirically where there are no hull lines at the initial design stage by referring to the expected waterline area coefficient and the demihull expected block coefficient as follows:

$$z_c = \frac{T}{1+\delta/a} \qquad (5)$$

Thus the transverse metacentric height can be estimated. In comparison with a monohull, the GM will be up to four times as great due to demihull separation.

The moment of statical stability at a small angle of heel is expressed as:

Moment of statical stability = $W \times GZ$

$\therefore$ Moment of statical stability = $W \times GM \times \sin\theta^o$ (6)

Catamaran Stability for Larger Disturbances

The ship's buoyancy force shifts to the low side, causing a significant angle of heel and a shift in the moment of statical stability.

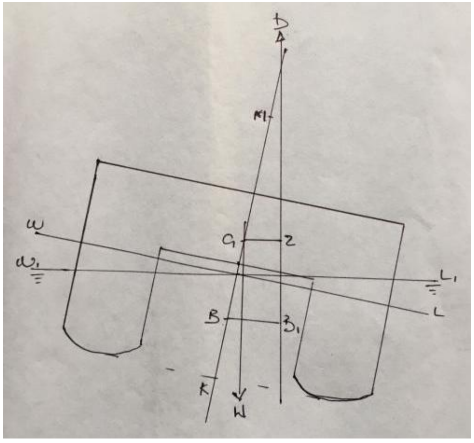

Figure 4. effect of large angle of heel on a catamaran

But GZ is no longer equal to $GM \sin\theta^o$. Up to the angle at which the deck edge is immersed, it may be found by using a formula known as the ***Wall-sided formula***.i.e.

$$GZ = (GM + \frac{1}{2}BM\ \tan^2\theta)\sin\theta \qquad (7)$$

The derivation of the formula is as follows:

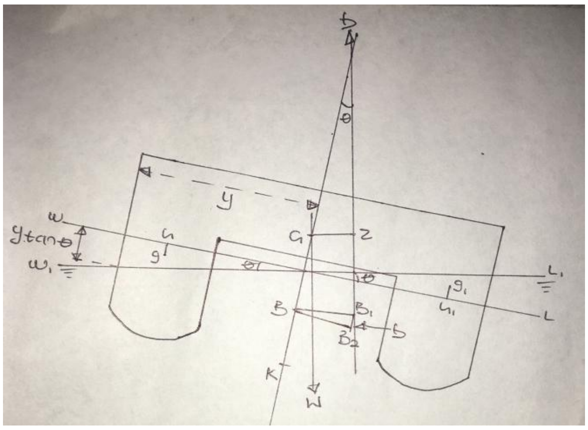

Figure 5: Stability at large angles

Figure 5 illustrates a ship's center of gravity shifting when wedge WOW1 is transferred to LOL1, with horizontal components hh1 and BB2 and vertical components gh + g1h1 and B1B2.

Now consider the wedge LOL_1

$$Area = \frac{1}{2}y^2\ \tan\theta$$

Consider an elementary strip longitudinally of length dx as in figure 6(b)

$$Volume = (\frac{1}{2}y^2\ \tan\theta)dx$$

The horizontal shift from the wedge (hh1), is $\frac{2}{3}\times 2y$ or $\frac{4}{3}\times y$

$\therefore$ Moment of shifting this wedge $=\frac{4}{3}y\times\frac{1}{2}y^2\tan\theta dx=\frac{2}{3}y^3\tan\theta dx$

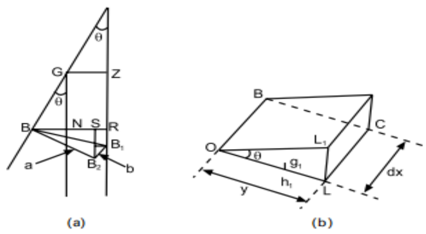

Figure 6

The sum of moment of all such wedges $=\int_0^L \frac{2}{3}y^3\tan\theta dx=\tan\theta\int_0^L \frac{2}{3}y^3 dx$

But the second moment of the water-plane area about the centre-line

$$I=\int_0^L \tfrac{2}{3}y^3 dx$$

$\therefore$ Sum of the moment of all such wedges $=I\times\tan\theta$

$$BB_2=\frac{v\times hh_1}{V}$$

$$V\times BB_2=v\times hh_1$$

But, the sum of the moments of the wedges $=v\times hh_1$

$$\therefore V\times BB_2=I\times\tan\theta$$

$$BB_2=\frac{I}{V}\times\tan\theta$$

$BB_2=BM\times\tan\theta$ ---------- 'a'

The vertical shift of the wedge $=gh+g_1h_1$

$=2gh$

$\therefore$ The vertical moment of the shift $=v\times 2gh=2vgh$

In figure 6(b)

$OL=y$ and $Oh_1=\frac{2}{3}y$

$$LL_1=y\tan\theta$$

$$\therefore g_1h_1=\frac{1}{3}y\tan\theta$$

The volume of the wedge $=\frac{1}{2}y^2\tan\theta dx$

The moment of the vertical shift $=\frac{1}{2}y^2\tan\theta dx\times\frac{2}{3}y\tan\theta$

$$=\frac{1}{3}y^3\tan^2\theta dx$$

The vertical moment of all such wedges $=\int_0^L \tfrac{1}{3}y^3\tan^2\theta dx$

$$=\frac{1}{2}I\tan^2\theta$$

$\therefore$ The moment of the vertical shift $=\frac{1}{2}I\tan^2\theta$

Also

$$B_1B_2 = \frac{v \times 2gh}{V}$$
$$V \times b = 2vgh$$

but

$$2vgh = \text{The vertical moment of the shift}$$

$$\therefore V \times b = \frac{1}{2} I \tan^2 \theta$$

or

$$b = \frac{I}{V} \times \frac{\tan^2 \theta}{2}$$

$$B_1B_2 = \frac{BM \tan^2 \theta}{2} \text{ ----------------- 'b'}$$

Referring to figure 6(a)

$$GZ = NR$$
$$= BR - BN$$
$$= (BS + SR) - BN$$
$$= a\cos\theta + b\sin\theta - BG\sin\theta$$
$$= BM \tan\theta\cos\theta + \frac{1}{2} BM \tan^2\theta\sin\theta - BG\sin\theta \quad \text{[from 'a' and 'b']}$$
$$= BM \sin\theta + \frac{1}{2} BM \tan^2\theta\sin\theta - BG\sin\theta$$
$$\text{GZ} = \sin\theta(BM + \frac{1}{2} BM \tan^2\theta - BG)$$
$$GZ = \sin\theta(GM + \frac{1}{2} BM \tan^2\theta) \quad \text{[for } \theta \text{ up to } 25^o\text{]}$$

This is the Wall-sided formula.
The formula for calculating the GZ at any angle of heel, as long as the ship's side is parallel to LL1, can be omitted for small angles.

$$\text{Moment of statical stability } = W\left(\frac{v \times hh_1}{V} - BG\sin\theta\right) \quad (8)$$

The derivation of the formula is as follows:

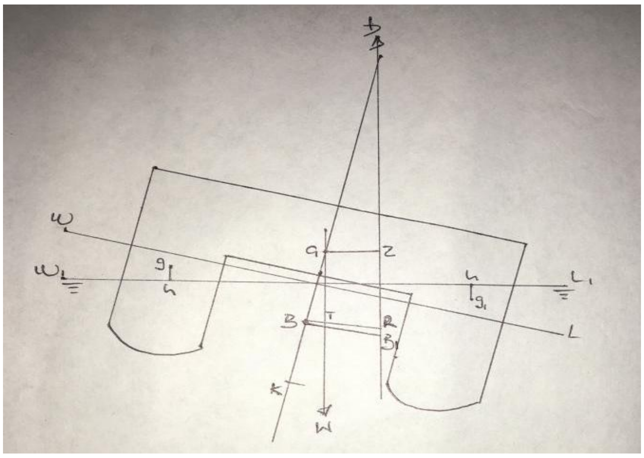

Figure 6: Stability at a large angle

$$\text{Moment of statical stability } = W \times GZ$$
$$= W(BR - BT)$$

Let v = the volume of the immersed or emerged wedge,
hh$_1$ = the horizontal component of the shift of the centre of gravity of the wedge,
V = the underwater volume of the ship, and
BR = the horizontal component of the shift of the centre of buoyancy

$$BT = BG \sin\theta$$

also

$$BR = \frac{v \times hh_1}{V}$$

$$\therefore \text{ Moment of statical stability } = W\left(\frac{v \times hh_1}{V} - BG\sin\theta\right)$$

Once the preceding calculations have been made, it is necessary to construct the transverse stability curves for the vessel and verify that the requirements specified by the IMO can be met.

Catamaran Longitudinal Stability

The initial longitudinal metacentric height H (GM_L) can be written

$$GM_L = BM_L + \left(z_c - z_g\right) \tag{9}$$

BM_L may be estimated as follows for a typical catamaran:

$$BM_L = \frac{a^2}{14\delta} \times \frac{L^2}{T} \tag{10}$$

A catamaran's transverse stability is higher than a conventional monohull due to demihull separation, but its longitudinal stability is smaller due to demihull fineness.

Results and Discussion

Results Analysis

Stability Calculation for Fully Loaded Catamaran

Loadcase - Fully loaded ship to maximum free-board draught
Damage Case - Intact
Free to Trim
Specific gravity = 1.025; (Density = 1.025 tonnes/m^3)
Fluid analysis method: Use corrected VCG
Total passengers = 445 ; Crew = 5
A minimum weight of 75 kg shall be assumed for each passenger.

$$\therefore \text{ weight/passenger } = \left(\frac{75\text{kg}}{1000}\right) \text{tonnes } = 0.075 \text{ tonnes}$$

$$\text{Total weight of 445 passengers} = 33.375 \text{ tonnes}$$

$$\text{Total weight of Crew} = 0.375 \text{ tonnes}$$

Luggage = 5kg per passengers

$$\text{Total weight of luggage} = \frac{5}{1000} \times (445 + 5) = 2.25 \text{ tonnes}$$

From the loading sheet we arrived at a final displacement of 301.385tonnes, and solid KG of 3.496m.
From equation (1), the righting lever for small disturbance below 15^o angle of heel is:

$$GZ = GM \times \sin\theta^o$$

From equation (6), the righting lever for larger disturbance above 15^o angle of heel is:

$$GZ = (GM + \frac{1}{2}BM\tan^2\theta)\sin\theta$$

Equation (1) and (6) are used to calculate for the righting lever, GZ at different angle of heel shown in the table below:
To check the ship's compliance to minimum IMO requirement, Result for stability calculation for loadcase 1 (hydrostatic particulars of the ship) will be used to construct the curve of statical stability (Graph of GZ against heel angle).

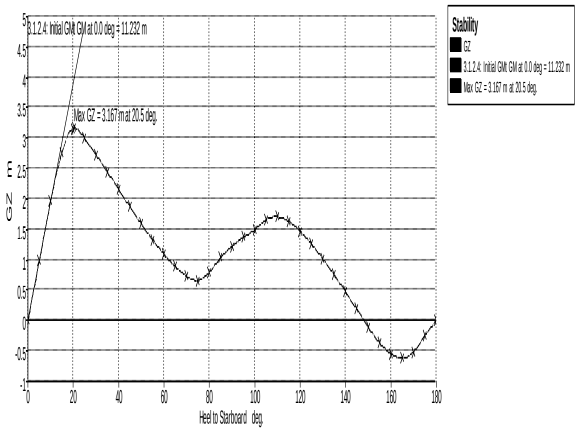

Figure 18: Curve of statical stability for load case 1

Table 5 The area under the righting lever curve (GZ curve) between 0º - 30º

GZ	SM	AREA
O	**1**	**0**
1.968	**3**	**5.904**
3.162	**3**	**9.486**
2.736	**1**	**2.736**

Σf(Area) = 18.126 ;   Common Interval, h = 10º

Converting degree to radian: 1º = $\frac{\pi}{180}$

From equation (11) $Area_{0-30} = \frac{3}{8} h \times \sum f(Area)$

$\therefore Area_{0-30} = 1.1864 m - rad$

Table 6. The area under the righting lever curve (GZ curve) between 0º - 40º

GZ	SM	AREA
O	**1**	**0**
3.162	**4**	**12.648**
2.167	**1**	**2.167**
		14.815

Σf(Area) = 14.815 ;   Common Interval, h = 20º

Converting degree to radian: 1º = $\frac{\pi}{180}$

From equation (10) $Area_{0-40} = \frac{1}{3} h \times \sum f(Area)$

$\therefore Area_{0-40} = 1.7238 m - rad$

Table 7. The area under the righting lever curve (GZ curve) between 30º - 40º

GZ	SM	AREA
2.736	**1**	**2.736**
2.455	**4**	**9.82**
2.167	**1**	**2.167**
		14.723

Σf(Area) = 14.723 ; Common Interval, h = 5º

Converting degree to radian: 1º = $\frac{\pi}{180}$

From equation (10): $Area_{30-40} = \frac{1}{3} h \times \sum f(Area)$

$\therefore Area_{30-40} = 0.4283 m - rad$

It is necessary to calculate the maximum moment of statical stability. From equation (3.5): Moment of statical stability = $W \times GM \times \sin \theta^{o}$

Where, W =301.385tonnes; GZ(max) = 3.167m

Moment of statical stability

= 301.385(3.167)

= 954.4833 tonnes-m

Stability Calculations Considering Lightship and Full Tanks

Load case - Lightship and full tanks

Damage Case - Intact

Free to Trim

Specific gravity = 1.025; (Density = 1.025 tonne/m^3)

Fluid analysis method: Use corrected VCG

From the loading sheet we arrived at a final displacement of 239.115tonnes, and solid KG of 3.496m.

Equation (1) and (6) are used to calculate for the righting lever, GZ at different angle of heel.
To check the ship's compliance to minimum IMO requirement, data of the hydrostatic particulars of the ship will be used to construct the curve of statical stability (Graph of GZ against heel angle).

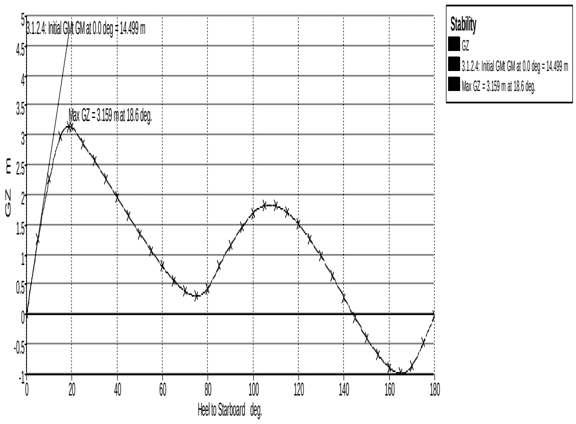

Figure 19: Statical stability curve for load case 2

Table 9. The area under the righting lever curve (GZ curve) between 0º - 30º

GZ	SM	AREA
0	**1**	**0**
2.27	**3**	**6.81**
3.146	**3**	**9.438**
2.586	**1**	**2.586**

Σf(Area) = 18.834 ; Common Interval, h = 10º

Converting degree to radian: 1º = $\frac{\pi}{180}$

From equation (11): $Area_{0-30} = \frac{3}{8} h \times \sum f(Area)$

$\therefore Area_{0-30} = 1.2327 m - rad$

Table 8. The area under the righting lever curve (GZ curve) between 0º - 40º

GZ	SM	AREA
O	**1**	**0**
3.146	**4**	**12.584**
1.976	**1**	**1.976**
		14.56

Σf(Area) = 14.56 ; Common Interval, h = 20º

Converting degree to radian: 1º = $\frac{\pi}{180}$

From equation (10): $Area_{0-40} = \frac{1}{3} h \times \sum f(Area)$

$\therefore Area_{0-40} = 1.6941 m - rad$

Table 10. The area under the righting lever curve (GZ curve) between 30º - 40º

GZ	SM	AREA
2.586	**1**	**2.586**
2.284	**4**	**9.136**
1.976	**1**	**1.976**
		13.698

$\Sigma f(Area) = 13.698$; Common Interval, $h = 5^o$

Converting degree to radian: $1^o = \dfrac{\pi}{180}$

From equation (10): $Area_{30-40} = \dfrac{1}{3} h \times \sum f(Area)$

$\therefore Area_{30-40} = 0.3985 m - rad$

From equation (.5): Moment of statical stability = $W \times GM \times \sin \theta^o$
Where, W = 239.115; GZ (max) = 3.159m
Moment of statical stability = 239.115(3.159) = 755.364tonnes-m

Stability calculation considering just the lightship

Loadcase - Lightship only
Damage Case – Intact
Free to Trim
Specific gravity = 1.025; (Density = 1.025 tonne/m^3)
Fluid analysis method: Use corrected VCG

From the loading sheet we arrived at a final displacement of 210tonnes, and solid KG of 4m.

Equation (1) and (6) are used to calculate for the righting lever, GZ at different angle of heel.
To check the ship's compliance to minimum IMO requirement, data in the hydrostatic particulars of the ship will be used to construct the curve of statical stability (Graph of GZ against heel angle).

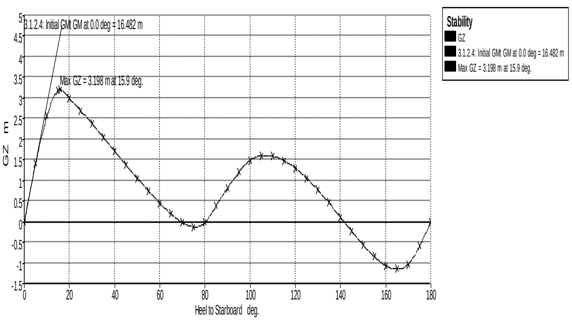

Figure 20: Statical stability curve for loadcase 3

Table 11. The area under the righting lever curve (GZ curve) between 0º - 30º

GZ	SM	AREA
O	1	0
2.557	3	7.671
3.006	3	9.018
2.379	1	2.379

$\Sigma f(Area) = 19.068$; Common Interval, $h = 10^o$

Converting degree to radian: $1^o = \dfrac{\pi}{180}$

From equation (11) $Area_{0-30} = \dfrac{3}{8} h \times \sum f(Area)$

$\therefore Area_{0-30} = 1.248 m - rad$

Table 12. The area under the righting lever curve (GZ curve) between 0º - 40º

GZ	SM	AREA
O	1	0
3.006	4	12.024
1.719	1	1.719
		13.743

Σf(Area) = 13.743 ; Common Interval, h = 20º

Converting degree to radian: 1º = $\frac{\pi}{180}$

From equation (10): $Area_{0-40} = \frac{1}{3} h \times \sum f(Area)$

$\therefore Area_{0-40} = 1.5991 m - rad$

Table 13. The area under the righting lever curve (GZ curve) between 30º - 40º

GZ	SM	AREA
2.379	1	2.379
2.051	4	8.204
1.719	1	1.719
		12.302

Σf(Area) = 12.302; Common Interval, h = 5º

Converting degree to radian: 1º = $\frac{\pi}{180}$

From equation (10): $Area_{30-40} = \frac{1}{3} h \times \sum f(Area)$

$\therefore Area_{30-40} = 0.3579 m - rad$

From equation (5): Moment of statical stability = $W \times GM \times \sin \theta^o$
Where, W =210; GZ(max) = 3.198m
Moment of statical stability = 210(3.198) = 671.58tonnes-m

Hydrostatic Curves
Damage Case - Intact
Fixed Trim = 0 m (+ve by stern)
Specific gravity = 1.025; (Density = 1.025 tonne/m^3)

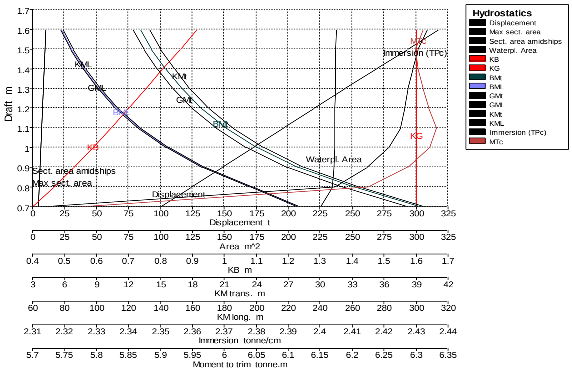

Figure 21: Hydrostatic Curve

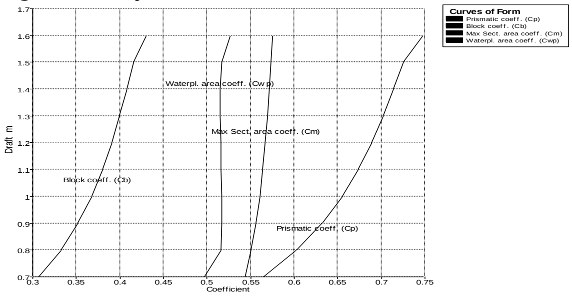

Figure 22: Curve of form

Discussion

This study focuses on understanding the intact stability characteristics of a catamaran under different loading conditions. The study aims to produce better allocation and arrangement plans for machinery, cargo hold, equipment (crane), and stowage and ensure sufficient stability for the ship satisfying the IMO-SOLAS Intact Stability Criteria. The distinctive feature of a catamaran is its higher transverse stability than that of a conventional monohull due to demihull separation. The same data for vessel displacement characteristics, mass, and center of gravity were used to assess static stability and calculate the righting moment available from the upward buoyancy force compared with the overturning moment from the vessel mass operating at its vertical center of gravity (VCG). During the stability analysis, the maximum righting lever (GZmax), when multiplied with the displacement of the ship, gives the value of the maximum heeling moment that the ship can sustain without capsizing. The GZ curve can be obtained easily and the vessel's stability determined. It can be concluded that the stability of a surface ship can be measured with two parameters: the metacentric height (GM) and the range (area) of stability. From the result analysis, the values of these parameters comply with the IMO minimum criteria for intact stability of a surface ship, with exception for one design criteria, which is the angle of maximum GZ.

Conclusion

In conclusion, the study contributes to the understanding of the intact stability characteristics of a Catamaran under all different loading conditions, helping to produce better allocation and arrangement plans for machinery, cargo hold, equipment (crane), stowage, and ensure sufficient stability for the ship satisfying the IMO-SOLAS Intact Stability Crite

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Application of Scale Finite Element Method for Evaluating Ship Longitudinal Strength

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Abstract

This research investigates the longitudinal strength of ship hull girders under complex loading conditions using nonlinear finite element method (FEM) analysis. The study employs ABAQUS software to model the MST-3 vessel, focusing on vertical bending moments and the effects of torsion. A comprehensive three-dimensional finite element model spanning three web frame spacings is developed to ensure the validity of the analysis, with boundary conditions and material properties carefully defined. The results highlight critical stress distributions within the hull girder, emphasizing that hull girder stresses due to vertical bending and torsion significantly influence total stress, especially near cargo hold bulkheads and hatch coamings. Torsion-induced warping stresses were found to be predominant in open-deck configurations. The FEM results closely align with experimental findings, demonstrating the model's accuracy in predicting the ultimate longitudinal strength of the hull girder. This study underscores the efficacy of nonlinear FEM analysis in assessing ship structural integrity under various load conditions and contributes valuable insights into hull girder behavior. The findings provide a foundation for improving ship design practices, ensuring structural reliability, and enhancing safety in marine operations.

Keyword*; Design, Hull Girder, Stress, Torsional Effects, Bending Momen*

Introduction

The hull girders of a ship play a major role in the structural system's strength and integrity. It is crucial to assess the most severe loads that can be placed on a hull girder in order to ascertain its strength. When assessing a ship's strength, three factors are often taken into account: longitudinal, transverse, and local. The stability of the ship is significantly impacted by the longitudinal strength of each of its parts (Joynal, *et al.* 2023). Ships with open decks feature larger hatches, which create challenges in maintaining hull strength. These expansive deck openings influence hull stress under both longitudinal and transverse bending. Moreover, wide deck openings in rough seas can diminish hull stiffness against torsional loads (Richardson, 2015). Axial (warping) and shear stresses arise in thin-walled beams under torsion, with warping stresses concentrated around hatch corners. Torsional loading occurs when a ship encounters oblique waves, accompanied by a reduced vertical wave bending moment (Shama, 2010).

Studies on hull strength under combined bending and torsion have provided valuable insights. Elbatouti et al. (2022) utilized finite element methods (FEM) to analyze the SS-7 container ship under vertical, lateral, and torsional moments, identifying that local deformations significantly elevate stress levels in inner bulkhead plates due to structural non-prismatic features and deck openings. Ostapenko (1986) found that torsion in oblique seas reduces a ship's longitudinal hull strength, highlighting the need for robust hull design to enhance safety and performance under various loading conditions.

Similarly, Parunov (2021) examined two general cargo ships and reported sufficient stress levels and compliance with the Croatian Registry of Shipping rules, suggesting the structures could handle intended loads. Vemon and Nadeau (1987) compared St. Venant and warping-based theories for thin-walled beams, concluding that the latter offers a superior representation of prismatic thin-walled sections by incorporating longitudinal deformation. Tang et al. (2019) employed three real-time methods to assess hull longitudinal strength, local yield strength, and fatigue, identifying areas prone to damage under varying wave azimuths. Valsgard et al. (1995) examined the structural impact of torsion, noting diagonal shear deformations, stress concentrations, and fatigue risks at hatch corners.

Research by Paik et al. (2001) explored the ultimate strength of a 4300 TEU container ship's hull under vertical bending and torsion, revealing torsion's limited impact on ultimate strength unless torsional rigidity is low. Iijima and Shigemi (2004) proposed a simplified method to estimate torsional strength by segmenting the hull girder and applying beam theory, emphasizing its importance in container ship design. Senjanovic and Rudan (2008) used 3D FEM to evaluate torsional effects in large container ships, concluding that transverse bulkheads minimally affect bending stiffness but stressing the role of hydroelastic analysis. Chirica et al. (2009) proposed a quick calculation method for torsional analysis using thin-walled beam theory, while Parunov and Uroda (2010) applied FEM to highlight stress-prone areas in general cargo ships, advocating for fine mesh modeling to improve structural safety. Senjanovic and Vladimir (2011) advanced thin-walled girder theories and hydroelastic analysis techniques, employing modified Timoshenko beam theory and FEM tools for ultra-large container ships, validating results through Euler–Bernoulli theory comparisons. Novikov and Antonenko (2015) emphasized the correlation between bending and torsion loads on hull girder stresses, while Vladimir and Senjanovic (2016) examined fatigue and extreme load resilience in conventional container ships. Rorup et al. (2016) utilized complex FEM models for improved design processes.

To accomplish the goal of the study, the following objectives were addressed.

1. Derive finite element formulae for calculating ship longitudinal strength.
2. Determine the hull girder strength of a vessel, as well as studying the strength of a vessel and find possible reason for deformation.
3. Analyzing stress distribution throughout the hull, as well as identifying areas of high stress concentration.
4. To determine the longitudinal strength of a vessel by making use of MATLAB software

Materials and Methods

Material

The material for this research work involves the use of ABAQUS software to conduct a finite element analysis on the MST-3 vessel. MST-3 vessel is used as a case study for this research work. When a ship's hull is intact, it can withstand applied loads that are less than the design load and won't experience any structural damage under typical seagoing and authorized cargo loading conditions. However, because of the nature of strong waves and the potential for irregular cargo loading and unloading, the loads acting on the ship hull are unpredictable. In exceptional instances, the ship hull may collapse both locally and globally due to exerted loads exceeding design loads. The ship hull's structural components will yield in tension and buckle in compression as exerted loads rise over the design loads. Buckling and collapse of more structural elements will gradually develop as loads climb further, until the hull girder as a whole reaches the ultimate limit condition.(Jeom & Alaa. 1995).

HOW TO USE FEM TO DETERMINE THE MST-3 SHIP'S LONGITUDINAL STRENGTH

A variety of models with finite element lengths were proposed by various researchers, ranging from full-scale ship models to 1+1/2 holds models, 1+1/4 holds models, 1/2+1/2 transverse frame spacing, 1/2+1+1/2 hold tanks, three cargo hold models, and 1+1+1 web-frame spacing.

Since the neutral axis shifting in this study depends on the model's curvature during the progressive collapse analysis, it is required to expand the model sufficiently to remove the boundary condition's influence on the analysis. According to the analysis, it makes sense to at least extend the finite element model to three web frame spacing (see Figure .1). The study is valid in the center part of the finite element model. A full breadth model should be used in the transverse plane, and a full depth model in the vertical direction.

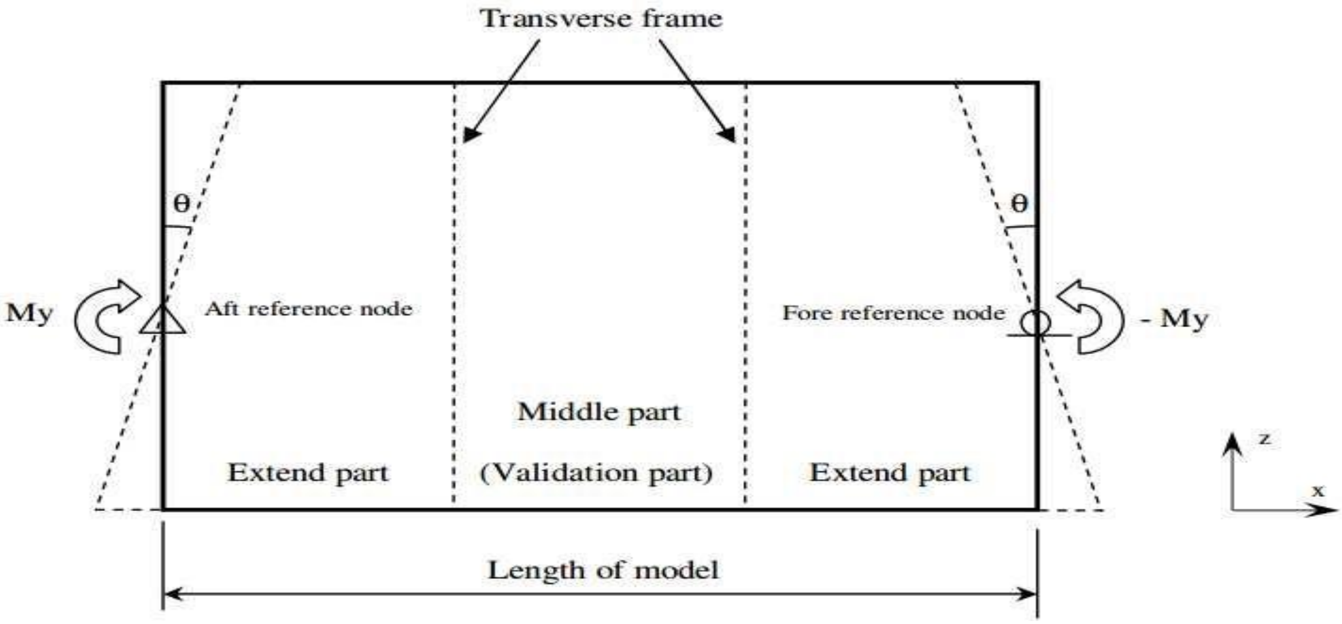

Figure 1: The finite element model's foundation in this investigation.

Boundary Conditions

The displacement at the two ends of the model (in Figure 1) can be simulated by means of multiple points constraints, it so called MPC. The independent point (reference point) is located at aft and fore end of model, there are the intersection between centerline and either centroid of the cross section or an arbitrary height of a cross section of ship hull girder. The simply supported will be applied at two independent points as Table 1.

Table 1 Boundary Conditions of the Independent Points

Location of independent point	translational			rotational		
	Dx	Dy	Dz	Rx	Ry	Rz
Aft end of the model	fixed	fixed	fixed	fixed	-	fixed
Fore end of the model	-	fixed	fixed	fixed	-	fixed

TYPE OF ELEMENT

To simulate ship structures, a variety of shell elements are provided. The majority of finite element algorithms incorporate general purpose shell elements, which are utilized for thick and thin shell issues and offer precise solutions in those situations. The small-strain shell elements S4R5 (Each node has five degrees of freedom., hourglass control, reduced integration, and a four-node thin shell with a double curvature.*)* in ABAQUS are employed in this investigation.

INITIAL DEFLECTIONS

Elastic buckling mode is used to assume the initial shape deflections (see Figure 2). The equation below provides it.

$$W_i = A_o \sin \frac{mnx}{a} sin \frac{mny}{b} \qquad (1)$$

Where; m is a half-sinusoidal wave number that separates the longitudinal stiffeners. Stiffener sideways, stiffener lateral, and form initial deflection amplitude of the plate between stiffeners are denoted by A0, B0, and C0, respectively.

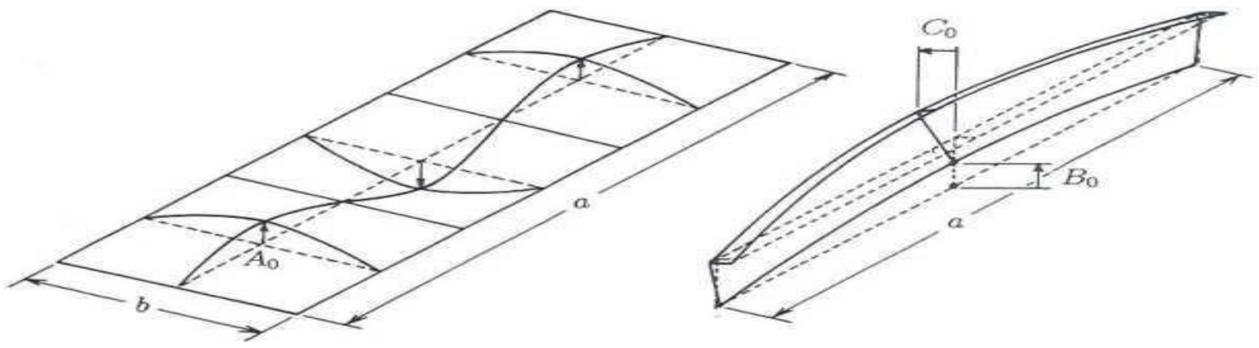

Figure 2. Assumed initial deflections in stiffened plates

Residual Stress

Hughes' equation is used in this work to evaluate the residual stresses resulting from welding.

$$\sigma_r = \frac{2\eta}{\frac{s}{t}-2\eta}\sigma y \qquad (2) \qquad\qquad \eta = \frac{1}{tp}\left[\frac{tw}{2} + 0.26 + \frac{\Delta Q}{tw} + 2tp\right] \qquad (3)$$

where:

Web thickness is denoted by tw

tp is the thickness of plate

$\Delta Q = 78.8l2$, $l = 0.7tw$ when $0.7tw < 7.0$ mm, $l = 0.7$ when $0.7tw \geq 7.0$ mm.

BENDING MOMENT (BM) CALCULATION

The bending moment at a section of a ship's hull can be calculated using:

$$BM = \frac{wl^2}{8} \qquad (4)$$

Where:

w = uniform load per unit length (N/m)

L = length of the section (m)

SHEAR FORCE (SF) CALCULATION

The shear force at a section can be calculated as:

$$SF = \frac{wl}{2} \qquad (5)$$

STRESS CALCULATION

The bending stress (σ) at the neutral axis can be calculated using:

$$\sigma = \frac{m.c}{I} \qquad (6)$$

Where:

M= bending moment (Nm)

C = distance from the neutral axis to the outer fiber (m)

I = moment of inertia (m^4)

DEFLECTION CALCULATION

The deflection (δ) at midpoint of a beam with simple support can be calculated using:

$$(\delta) = \frac{5wl^4}{384EI} \qquad (7)$$

Where:

E = (Pa) = modulus of elasticity
I = m^4 (m = moment of inertia)

GOVERNING EQUATIONS

Governing equations for a beam under bending are given by:

$$\frac{d2}{dx2}\left(\frac{EId2y}{dx2}\right) = q(x) \qquad (8)$$

LONGITUDINAL BENDING STRESS

The longitudinal bending stress (σb) can be calculated using

$$\sigma b = \frac{M.y}{I} \qquad (9)$$

Where:

M = bending moment (Nm)

y = distance from the neutral axis (m)

I = moment of inertia (m^4)

AXIAL STRESS CALCULATION

The axial stress (σa) in a beam subjected to axial load can be calculated using:

$$\sigma a = \frac{P}{A} \qquad (10)$$

Where:

P = axial load (N)

A = cross-sectional area (m^2)

BUCKLING STRESS

For a slender column (or beam) under axial load, the critical buckling stress (σcr) can be calculated using:

$$(\sigma cr) = \frac{\pi 2E}{(KL)2} \qquad (11)$$

Where:

- E = modulus of elasticity (Pa)
- L = effective length of the column (m)
- k = column effective length factor (for a pinned-pinned column, k=1)

DEFLECTION DUE TO POINT LOAD

The deflection (δ) at the midpoint of a simple support beam under a point load PPP can be calculated using:

$$(\delta)= \frac{PL3}{48EI} \qquad (12)$$

3.RESULTS AND DISCUSSIONS.

Since the MST-3 model is 540 mm long, the finite element model's overall length is 3x540 mm (Figure 3). Figure 3 displays the cross section box girder scantlings.

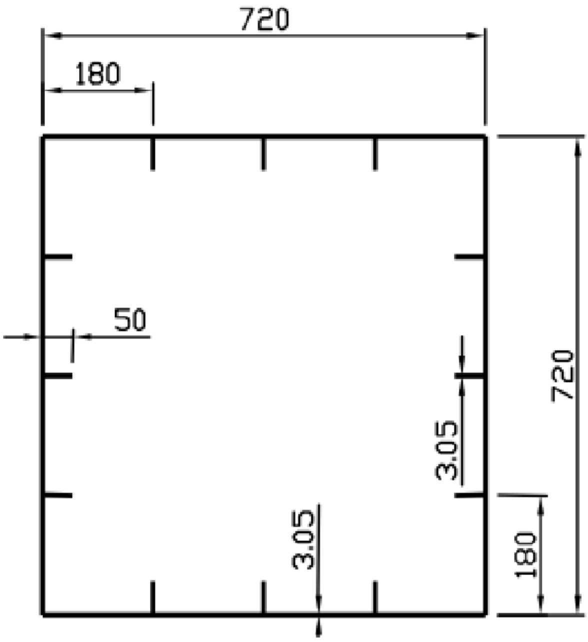

Figure 3: The MST-3 model's cross section scantling

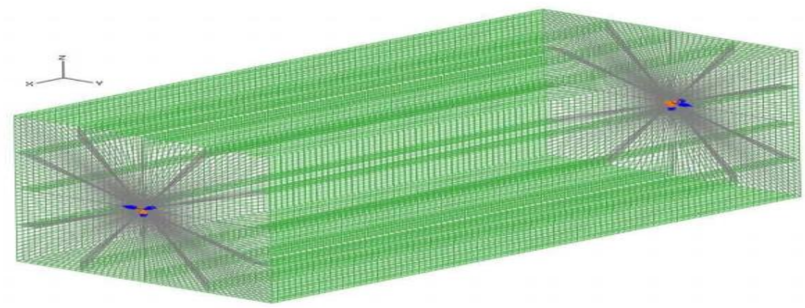

Figure 4: MST-3's finite element model

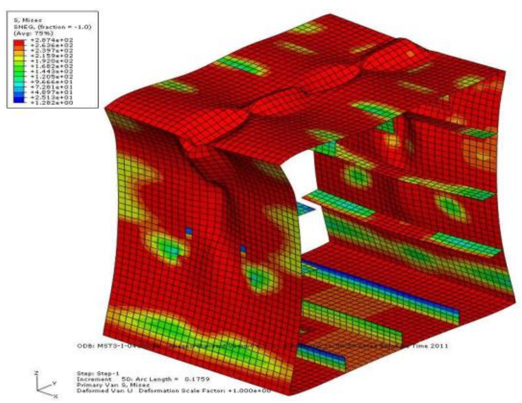

Figure 5 Von-Mises stress plot of validation part in sagging condition

The longitudinal strength of the FEM data is displayed in Table 2. It is evident that the FEM results correspond well with the experiment. For sagging conditions, the difference between the FEM case with residual stress and the case without is approximately 3%, whereas for hogging conditions, it is approximately 1%.

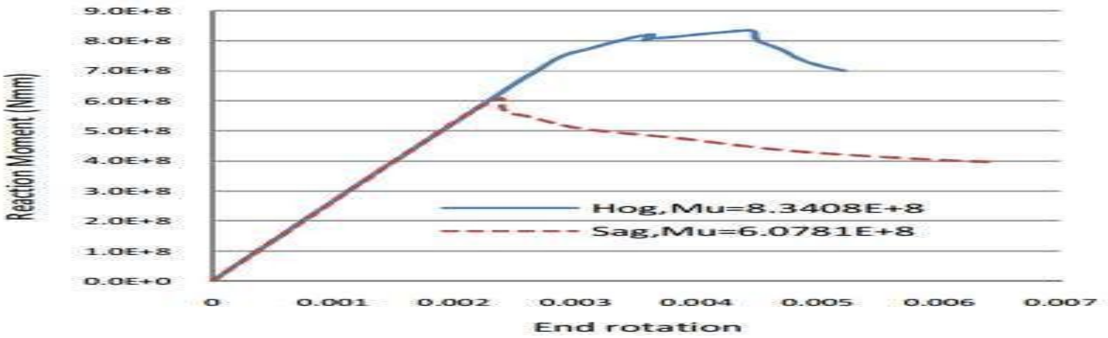

Figure 6 showing FEM results of hogging and sagging conditions

The FEM Method on A 1/3 Scale

Dow created the 1/3-scale Frigate model, which has the following overall measurements: 18 m in length, 4.1 m in width, and 2.8 m in depth. In Figure 10, the scantling is displayed. The validation portion measures 457.2 mm, or one frame space.

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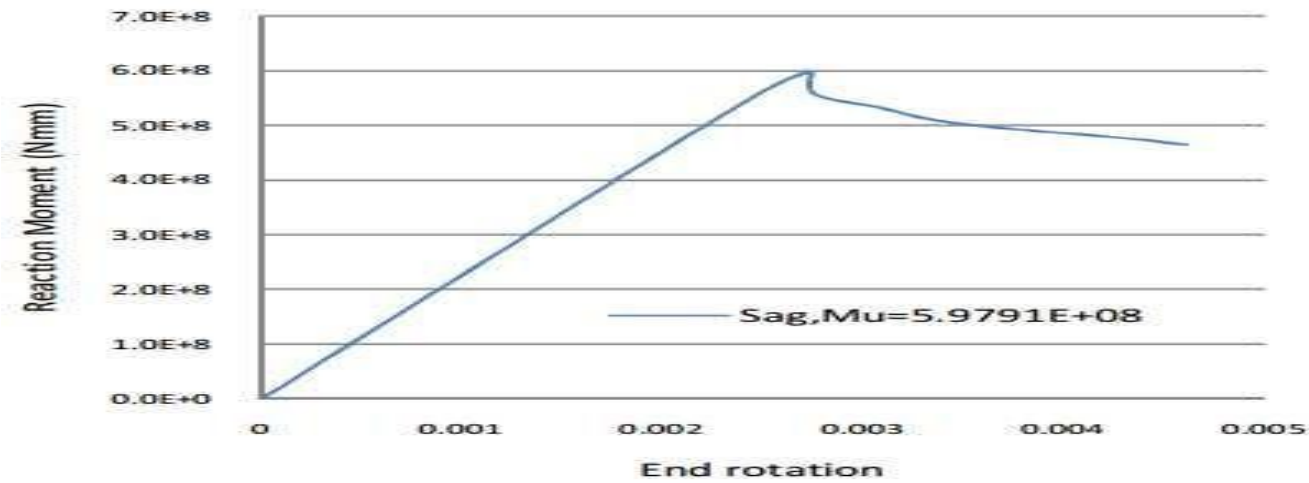

Figure 7 The MST model's ultimate longitudinal strength (MU) under sagging conditions when there is no residual stress

	Sagging (E+8 Nmm)			Hogging (E+8 Nmm)		
		FEM			**FEM**	
		Only initial deflection	**Initial deflection and residual stress**		**Only initial deflection**	**Initial deflection and residual stress**
MU	5.9330	6.0781	5.9028	8.3847	8.3408	8.3117
Difference		2.4 %	- 0.51 %		- 0.5 %	- 0.87 %

Table 2 The ultimate longitudinal strength of MSD model

Table 2 displays the findings of the FEM, whereas Figures 6 and 7 display the ultimate longitudinal strength MU of the MST-3 model under sagging conditions. There is a noticeable discrepancy in the FEM results. This indicates that the FEM's forecast of the ultimate longitudinal strength is accurate and true.

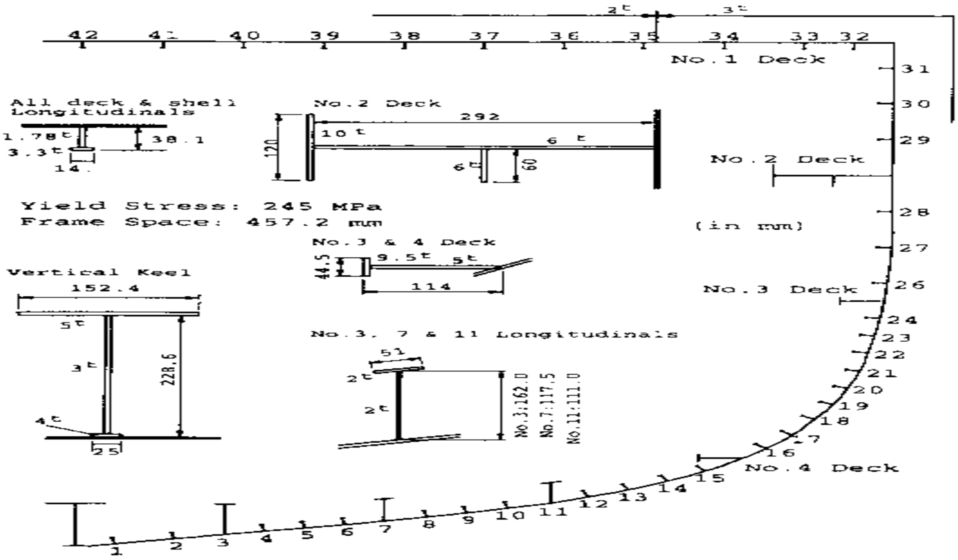

Figure 8 The 1/3-scale FEM model's cross section

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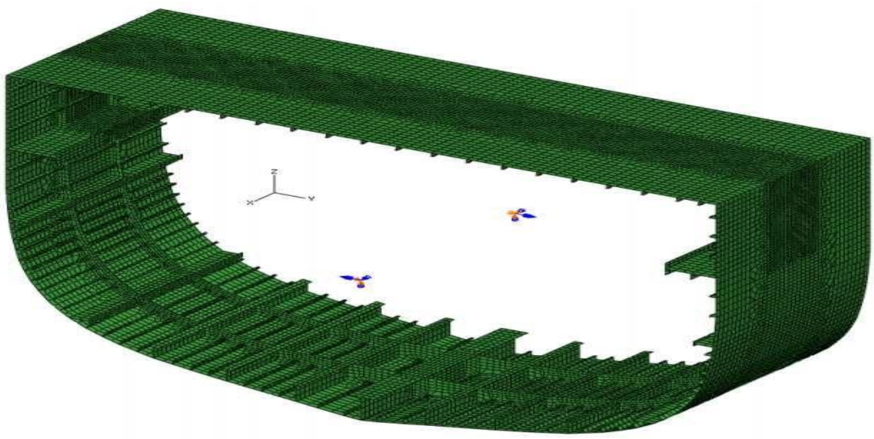

Figure 9 Finite element model of 1/3-scale

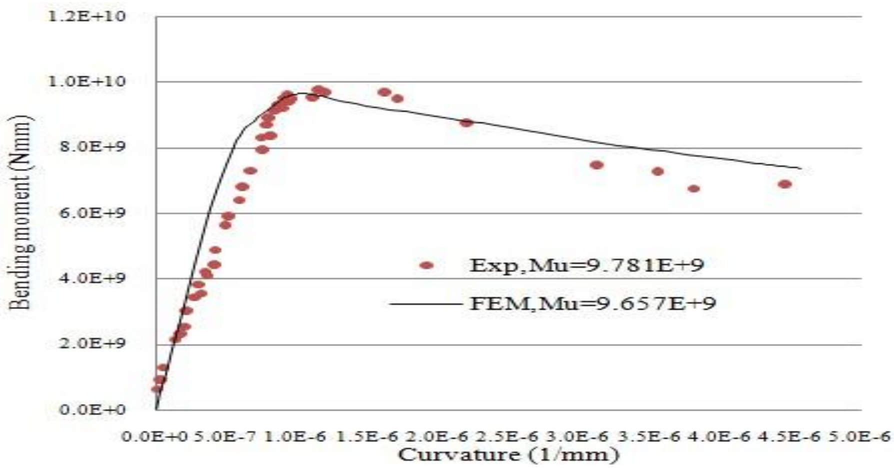

Figure 10 curvature

Figure 10 displays curves that calculated the progressive bending moment based on FEM results (black line) and experimental results (red dot points). This work differs from others in that it includes a web frame in the finite element model. As a result, the FEM results do well with the experimental data inside the post-ultimate regime.

Conclusions

in conclusion, this research underscores the vital role of finite element modeling and nonlinear analysis in evaluating ship longitudinal strength, particularly under complex loading conditions. By employing ABAQUS software and a modified FEM approach, the study achieved the following key outcomes:

1. The three-dimensional finite element model, extending over three web frame spacings, provided a reliable basis for analyzing the structural integrity of the MST-3 vessel. Incorporating web frames into the model further enhanced its accuracy, aligning FEM results closely with experimental data.
2. The findings highlight that hull girder stresses due to bending and torsion significantly influence total stress distribution, especially near critical areas such as cargo hold bulkheads and hatch coamings. These stress concentrations necessitate precise modeling to ensure structural reliability.
3. Analysis of stress distribution in open and closed-deck ships revealed that torsion-induced warping stress is a critical factor in open-deck configurations, contributing approximately 20% of the total stress in inclined conditions. This insight emphasizes the importance of accounting for torsional effects in hull design.
4. The application of FEM effectively captured both linear and nonlinear stress responses, enabling accurate predictions of the ultimate longitudinal strength of the hull girder. The integration of methods for bending moment, shear force, and deflection calculations further supports the robustness of the modeling framework.

This study not only validates the effectiveness of FEM in assessing ship hull strength but also provides a foundation for future research into hydroelasticity, fatigue resistance, and optimization of ship structures under extreme loads. These insights are critical for advancing safe and efficient ship design practices.

Recommendations

1. Incorporation of Advanced Material Models: Future studies should incorporate advanced material models, such as composite materials or high-strength steels, to evaluate their impact on hull longitudinal strength and torsional rigidity under extreme conditions.
2. Dynamic Loading Conditions: Investigate ship performance under dynamic loading scenarios, including extreme weather events, oblique wave interactions, and impact loads. This can provide a more comprehensive understanding of structural behavior in real-world conditions.
3. Hydroelastic Analysis Integration: Explore hydroelastic effects using advanced simulation tools to study the interaction between fluid dynamics and structural responses, especially for ultra-large vessels.
4. Improved Nonlinear Analysis Techniques: Implement refined nonlinear finite element methods to capture progressive collapse, buckling, and residual stress effects with greater accuracy.
5. Optimization of Structural Elements: Conduct parametric studies to optimize critical structural components such as web frames, hatch coamings, and transverse bulkheads for improved strength and weight reduction.
6. Validation with Full-Scale Testing: Perform full-scale experimental validations to verify finite element model predictions, particularly for innovative designs or extreme load cases

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