

## ENTREPRENEURSHIP SKILLS AND PRODUCT INNOVATION IN NIGERIAN TERTIARY INSTITUTION: A STUDY OF FEDERAL POLYTECHNIC, IDAH, KOGI STATE.

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### ABSTRACT

*This research investigates entrepreneurship skills and product innovation within the context of Nigerian tertiary institutions, with a focus on Federal Polytechnic, Idah, situated in Kogi State, the study aims to explore the extent to which entrepreneurship skills acquired by students contribute to fostering innovation in product development within the academic setting. The research employs a quantitative data collection methods. The population of the study consists of 200 National and Higher National Diploma students of Federal Polytechnic Idah, Kogi State. The sample size consists of 133 students. The study adopts correlation coefficient analysis to test the hypotheses. Findings from the study indicates that operational skills and product innovation is positively and significantly correlated, with a correlation coefficient of  $r = 0.954$  and a  $p$ -value of 0.000. Similarly, the relationship between technical skills and product innovation is positive and statistically significant, showing a correlation coefficient of  $r = 0.935$  and a  $p$ -value of 0.000. Additionally, the connection between conceptual skills and product innovation is positive and statistically significant, revealing a correlation coefficient of  $r = 0.935$  and a  $p$ -value of 0.000. Lastly, the relationship between human or interpersonal skills and product innovation is positive and statistically significant, with a correlation coefficient of  $r = 0.902$  and a  $p$ -value of 0.000. The study concludes that entrepreneurship education in Nigerian tertiary institutions contributes significantly to the development of entrepreneurial skills and the promotion of product innovation among students. The study recommended that, institution should organize workshops, seminars, and guest lecturers featuring successful entrepreneurs to inspire and guide students.*

**Keywords: Conceptual Skill, Entrepreneurship Skill, Human or Interpersonal Skill, Operational Skill, Product Innovation, Technical Skill,.**

### INTRODUCTION

Entrepreneurship skills and product innovation play a crucial role in the development and growth of economies around the world, and Nigeria is no exception. In recent years, there has been a growing recognition of the importance of fostering entrepreneurial skills and encouraging product innovation within the tertiary education system in Nigeria. Tertiary institutions, including universities and polytechnics, are becoming key players in shaping a generation of entrepreneurs who can contribute to

economic development and job creation (Adesanya, et al., 2018). Tertiary institutions in Nigeria are increasingly integrating entrepreneurship into their academic curricula; this includes the development of courses and programs that focus on imparting essential entrepreneurial skills such as critical thinking, problem-solving, communication, and business management (Ibidunni et al., 2021). These initiatives aim to equip students with the mindset and abilities required to identify opportunities and navigate the challenges of starting and managing businesses. Many tertiary institutions in Nigeria have established incubation centers and innovation hubs to nurture entrepreneurial talent. These spaces provide students with the resources, mentorship, and networking opportunities needed to turn their innovative ideas into viable businesses. These hubs often collaborate with industry experts, successful entrepreneurs, and investors to create a conducive ecosystem for entrepreneurial growth.

Tertiary institutions in Nigeria are actively engaged in research and development activities, with a growing focus on creating innovative products and solutions. Faculty and students collaborate on projects that aim to address local and global challenges through innovative technologies and processes. This research often leads to the development of new products with commercial potential. Many tertiary institutions have established mechanisms for transferring technology from academia to industry. This involves the commercialization of research findings and the development of partnerships with businesses to bring innovative products to the market. Through these initiatives, the academic community contributes to economic development by fostering innovation and entrepreneurship. Tertiary institutions are key components of the broader entrepreneurial ecosystem in Nigeria. By fostering a culture of innovation and providing support for startups, these institutions contribute to the creation of a vibrant entrepreneurial ecosystem. This ecosystem includes access to funding, mentorship, and networking opportunities, all of which are crucial for the successful development and commercialization of innovative products (Aguboshim, et al., 2021).

The significance of entrepreneurship skills on a global scale cannot be overstated, holding particular importance for both nations and the world at large. A nation's ability to provide for its citizens is pivotal for its development, and the issue of joblessness is exacerbated by the limitations of current curricula. The education system in Nigeria, inherited from colonial times, falls short in equipping graduates with the necessary skills to create employment opportunities, focusing predominantly on the pursuit of white-collar jobs (Agbo et al., 2015). This predisposition towards seeking traditional employment over entrepreneurial ventures contributes to the challenges associated with high unemployment rates.

Tertiary institutions in the country heavily emphasize theoretical teachings, lacking practical lessons. Consequently, graduates in fields such as engineering, accounting, medicine, and law often find themselves without the essential practical experience and skills required for gainful employment, let alone the capacity to initiate and create jobs. Joblessness is further compounded by organizational closures attributed to insufficient staff training, poor market understanding, inadequate infrastructure, political instability, and a lack of clear and effective marketing strategies (Johari et al., 2016). Additional challenges include insecurity, insufficient funding, and a dearth of innovation, poor corporate social responsibility, and limited community engagement.

This study aims to empirically investigate the relationship between Entrepreneurship Skills and Product Innovation in Nigerian tertiary institutions, with a focus on the Federal Polytechnic, Idah, Kogi State. The following research questions were addressed in the study:

- i. What is the effect of operational skills on product innovation in Federal Polytechnic Idah?
- ii. How does technical skill influence product innovation in Federal Polytechnic Idah?
- iii. What is the influence of conceptual skills on product innovation in Federal Polytechnic Idah?

- iv. What is the relationship between human or interpersonal skills and product innovation in Federal Polytechnic Idah?

The broad objective of the study is Entrepreneurship Skills and Product Innovation in Nigerian Tertiary Institution: A study of Federal Polytechnic, Idah, Kogi State. The specific objectives were to:

- i. Examine the effect of operational skills on product innovation in Federal Polytechnic Idah.
- ii. Examine the influence of technical skills on product innovation in Federal Polytechnic Idah.
- iii. Examine the influence of conceptual skills on product innovation in Federal Polytechnic Idah.
- iv. Investigate the relationship between human or interpersonal skills and product innovation in Federal Polytechnic Idah.

The research will aim to test the following hypotheses:

- H0<sub>1</sub>: Operational skill does not have effect on product innovation in Federal Polytechnic Idah.  
H0<sub>2</sub>: Technical skill does not influence product innovation in Federal Polytechnic Idah.  
H0<sub>3</sub>: Conceptual skill does not influence product innovation in Federal Polytechnic Idah.  
H0<sub>4</sub>: There is no significant relationship between human or interpersonal skill and product innovation in Federal Polytechnic Idah

## REVIEW OF RELATED LITERATURE

### The Concept of Entrepreneurship Skills

The term 'entrepreneurship skills' denotes the competencies essential for achieving success in entrepreneurship, distinct from attributes and behaviors commonly associated with entrepreneurs. An entrepreneur is characterized by a creative and innovative spirit, capable of generating novel and distinctive ideas, initiating a business startup, fostering creativity, identifying opportunities, embracing risk, and resourcefully developing and mobilizing ideas (Popescu, 2020). In essence, entrepreneurs embody qualities such as creativity, innovation, independence, confidence, resilience, diligence, discipline, risk-taking aptitude, opportunity recognition, and expertise in resource management, driving excellence in business creation, development, and advancement (Soegoto, 2019).

According to Sujana and Muhammad (2018), entrepreneurial skills serve as a crucial mechanism for economic development by contributing to employment generation, fostering innovation, and enhancing overall welfare. These skills encompass the ability to perceive business opportunities where others may not, actively seek and respond to change, and exploit change as an opportunity. Entrepreneurial skills are also viewed as capitalist qualities that enable the identification of lucrative opportunities, resource gathering, risk assumption through action, and the effective organization and management of resources to capitalize on identified opportunities.

The acquisition of entrepreneurial skills can be facilitated through various channels, including participation in entrepreneurial training classes, development program seminars and workshops, university education, job rotation, specialized (intensive) training, apprenticeship, organizational learning, research and development institutions, consulting services, as well as national and international agencies, non-governmental organizations (NGOs), and professional bodies (Kušleikiene & Sivickiene, 2019).

### Operational Skill and Product Innovation

Operational skills refer to the abilities and competencies necessary for efficiently managing day-to-day activities and processes within an organization. These skills are crucial for ensuring that the daily operations of a business run smoothly, effectively, and in line with organizational goals. Operational

skills are often associated with middle and lower-level management positions and involve a hands-on approach to managing various functions (Dodevski, 2018). Operational skills, particularly in budgeting and financial management, enable organizations to allocate resources efficiently, this includes funding research and development efforts, acquiring necessary technology, and investing in talent—all crucial components of the product innovation process, it include the ability to assess and manage risks (Moynihan, 2018).

### **Technical Skill and Product Innovation**

Technical skill deals with the specialized knowledge and abilities that individuals possess in a specific field or discipline, these skills are practical and often relate to the use of tools, techniques, and processes to perform specific tasks or solve particular problems. Technical skills are typically acquired through education, training, and hands-on experience in a specific domain. They are essential for performing specific job functions and are particularly crucial in professions that require a high level of expertise and precision. Technical skills can vary widely depending on the industry and job role (Fadzil & Saat, 2017). Technical skills provide the foundational knowledge and capabilities needed for the conceptualization, development and improvement of products, they empower professionals to navigate the complexities of product innovation, respond to market demands, and contribute to the advancement of industries through the introduction of new and improved products (Kamin et al., 2017).

### **Conceptual Skill and Product Innovation**

Conceptual skill is the ability to think and understand complex ideas, see the big picture and analyze situations from a strategic perspective. These skills involve the capacity to conceptualize and grasp abstract concepts, formulate innovative ideas, and make decisions that align with the overall goals of an organization (Kazmi et al., 2016). Conceptual skills are often associated with high-level management and leadership roles, where individuals need to navigate ambiguity, set strategic directions and understand the broader implications of their decisions, it significantly influence product innovation by enabling individuals, particularly leaders and decision-makers, to understand the broader context, envision possibilities, and strategically guide the development of new products (Fletcher et al., 2019).

### **Human or Interpersonal Skill and Product Innovation**

Human or interpersonal skills, often referred to as soft skills, involve the ability to interact effectively with others, communicate clearly, and build positive relationships. These skills are essential in various aspects of personal and professional life, influencing interactions with colleagues, clients, superiors, and other stakeholders (Pandey & Shukla, 2020). Human skills are particularly crucial in roles that require collaboration, teamwork, leadership, and effective communication. Human or interpersonal skills play a crucial role in product innovation by shaping the way teams collaborate, communicate, and work together throughout the innovation process. Effective interpersonal skills foster a collaborative environment where team members can work together cohesively (Pandey & Shukla, 2020). This collaboration is vital for sharing ideas, leveraging diverse perspectives, and collectively contributing to the innovation process.

### **Product Innovation**

Product innovation involves enhancing previous versions of goods and services in novel ways. This can entail redesigning existing products with improved quality to attract a larger customer base and boost sales, as noted by Jin and Cedrola (2018). Additionally, product innovation extends to the development of entirely new products that may garner greater consumer interest than existing offerings.

On the other hand, process innovation introduces a new approach to handling raw materials from the initial stages to the final stages of production. It encompasses the integration of various facilities, skills, and technologies to manufacture products and provide services. Entrepreneurs utilizing process

innovation may employ diverse machines to coordinate the three factors of production—land, labor, and capital—for the advancement and success of businesses, be they small, medium, or large ventures (Dotzel & Faggian, 2019).

## **Theoretical Review**

### **Human Capital Theory**

Becker's Human Capital Theory (1964) posits that entrepreneurs acquire skills through formal training or on-the-job experience, and emphasizes the need for compensating such training. According to this theory, individuals or groups endowed with higher levels of knowledge, skills, and competencies are likely to achieve superior performance outcomes compared to those with lower levels. The measurement of human capital can involve factors such as education, work experience, among others. The connection between this study and human capital theory lies in the premise that knowledge and skills obtained through entrepreneurship education empower entrepreneurs to incorporate innovations into their business operations, resulting in heightened productivity. Additionally, education enables entrepreneurs to stay informed about current technological techniques, contributing to more effective outcomes in their ventures.

### **Social Learning Theory**

Albert Bandura proposed Social Learning Theory in 1986. The primary principle of this theory is that people learn by observing others. Second, copying individuals who appear competent, powerful, distinguished, and eager promotes rapid learning. Observation may be a very effective learning strategy since it teaches individuals not just how to perform an action but also what will happen in specific scenarios when it is performed. The similarity between this study and social cognitive theory is that entrepreneurs can learn innovative talents by studying and imitating others. This can drive him to seek continual training and to upgrade his company activities with new technologies in order to provide greater results.

### **Adoption of the Theory**

Human capital theory is considered as theoretical framework for this study because, it emphasizes that individual can enhance their productivity and contributes to economic growth through investments in education, training, and skills development. In the context of entrepreneurship, individuals who possess relevant knowledge, expertise, and skills are better equipped to identify and exploit opportunities, leading to increased innovation and successful ventures.

## **Empirical Review**

Emenole and Edeoga (2022) conducted an analysis of the employment creation and income generation potentials of Small and Medium Scale Enterprises (SMEs) in Abia State, Nigeria. Sixty samples were randomly selected from each of these two SMEs, and the data collected were analyzed using income statement accounts and multiple regression analysis. The income statement account findings revealed that, on average, poultry firms in Abia State metropolis had an annual income-generating capacity of N2,534,200, while bakery firms had an average of N3,151,056. The regression analysis indicated that firm size (0.638) at a 1% level of significance and the number of departments (0.611) at a 5% level of significance are positively correlated with the employment capacity of these SMEs. In contrast, the availability of labor (-0.636) and the organization's profitability (-3.138) were negatively correlated with employment capacity. Each of these SMEs employed at least two and no more than five people. The study stated that small and medium-sized firms' potential for job creation and revenue generation are critical to Abia State's and Nigeria's economic development. The researchers proposed that the government promote entrepreneurship by providing social amenities and examining tax regulations that

may have a negative influence on SMEs' ability to generate income. However, the study's conclusions are applicable to this specific region.

James (2021) conducted a study comparing marketing skills and human relations competence and their impact on entrepreneurial productivity in the Northern Senatorial District of Ondo State. The research adopted a descriptive design, employing a stratified random sampling technique to draw a sample of 200 young entrepreneurs from a population of 2,674 entrepreneurs. The findings revealed that marketing competence exhibited a higher mean than human relations competence, and a statistically significant difference was observed between the two competencies. This suggests that students pursuing business education should acquire both human relations competence and marketing competence to effectively manage their businesses upon graduation. The critique of this literature is that, the study seems to focus on a specific region (Northern Senatorial District of Ondo State), and it lack a broader understanding of how contextual factors, cultural nuances, or economic conditions specific to that region could affect the generalizability of the findings.

Safinyu and Njogo (2019) investigated the influence of small and medium-scale enterprises on employment generation in Lagos State. The research utilized questionnaires and interviews as data collection instruments. Out of 150 distributed questionnaires, 120 were completed and retrieved, representing 80% of the total, while 30 copies (20%) were not recovered. The study employed two statistical methods for data analysis: simple percentage and chi-square ( $\chi^2$ ). The findings indicated a correlation between small and medium-scale enterprises and the sustainable development of the Nigerian economy. The research concluded that for any nation, regardless of its economic ideology, to achieve meaningful and sustainable development, there must be a concerted focus on widespread economic activities through entrepreneurship and the development of small and medium-scale enterprises. However, a critique of this literature points out that the absence of information regarding the research design and methodology raises concerns about the validity and reliability of the findings. A clear elucidation of data collection methods, sample selection processes, and the statistical techniques used is essential for assessing the study's rigor.

Ayodeji et al. (2019) investigated the operations, difficulties, and possibilities for youth employment programs in Oyo State, utilizing the Skill Acquisition Scheme and the Youth Empowerment Scheme - Oyo (YES-O) as case studies. The study used a survey approach, with structured questionnaires created for four types of respondents: trainees under the Skill Acquisition Scheme, tutors inside the scheme, administrators of both employment programs in the state, and cadets of the YES-O. To promote clarity and simplicity, descriptive statistical measures such as tables and percentages were employed for data analysis using statistical software (SPSS). The findings revealed several factors hindering the achievement of objectives for both schemes. A critique of this literature highlights the absence of a clear and concise problem statement that precisely defines the issues faced by the youth employment program in Oyo State. A well-articulated problem statement is crucial for guiding the research and conveying the significance of the study.

Abdulkareem (2018) conducted a study exploring the distinctions in entrepreneurial competencies and effective business management among business education students at Usman Danfodio University in Sokoto, Sokoto State. The research, employing a cross-sectional design, utilized a sample of 235 students (115 male and 120 females) drawn from the population through a simple random sampling technique. The collected data underwent analysis using one-way analysis of variance (ANOVA) and were tested at varying degrees of freedom. The findings revealed differences in entrepreneurial skills and effective business management among business education students. The study recommended the implementation of workshops, seminars, and training sessions aimed at enhancing entrepreneurial competencies and effective business management skills. It also suggested engaging students in

practical exercises, case studies, and real-world business simulations. A critique of this literature is that it lacks detailed information on how entrepreneurial competencies were defined and measured. If the measurement tools lack reliability or validity, it could potentially undermine the accuracy of the study's results.

Liu et al. (2018) conducted a study on the significance of human capital, social capital, and community trust in influencing migrants' entry into entrepreneurship. The research employed cross-sectional and panel data analyses using the 2012 and 2014 Chinese Labor-force Dynamics Survey (CLDS) data. The findings indicate that the rates of entrepreneurship and entrepreneurial entry for rural migrants surpass those of both urban residents and rural residents, highlighting their active participation in the urban business landscape. Further analysis of businesses owned by migrants reveals their over-representation in main-street industries. However, their firm performances are comparable to other businesses, suggesting a positive economic contribution in cities. The study recommended that Policymakers should design and implement inclusive entrepreneurship policies that recognize the diversity within migrant communities. Tailored support mechanisms, such as access to finance, business mentorship, and cultural integration programs, can empower migrants to overcome barriers and succeed as entrepreneurs. The critique of the literature is that, the study does not clearly define and operationalize human capital, social capital, and community trust. Lack of precision in these definitions can lead to ambiguity and potential misinterpretation of results

Murphy et al. (2018) conducted an examination of enterprise financing in the emerging economies of Ghana, Pakistan, and Yemen within the context of global dynamics. The research methodology involved a comparative study of these three countries, going into their economic background, financial institutions, enterprises, and mechanisms for funding small and medium-sized enterprises (SMEs). The study revealed that financial institutions exert a significant influence on enterprises, particularly in terms of the funding mechanisms for SMEs. The comparative analysis led to the development of a fundamental model, representing a significant contribution to knowledge in understanding the financing of SMEs in emerging economies. The critique of this literature is that, the study may excessively focus on global dynamics without adequately addressing the unique local and regional factors that influence enterprise financing in Ghana, Pakistan, and Yemen. A more balanced analysis should consider both global and local dynamics.

Frimpong (2018) conducted a study with a sample size of 220 students to investigate the impact of entrepreneurship education on intentions to join in partnership ventures. The study's hypotheses were tested using logistic regression models with a 5% error threshold. According to the findings, characteristics such as large-scale production, prior experience managing partnership ventures, company continuity, and availability to finances all had a statistically significant impact on the plans to create a partnership venture after graduation. However, at the same error level, characteristics such as gender, closeness to and acquaintance with possible venture partners, and business concepts and opportunities inside the venture partnership were found to be statistically irrelevant. This shows that these variables have little or no influence on entrepreneurship students' decision to pursue partnership ventures. The critiques of this literature is that, entrepreneurship education might not adequately address relationship-building skills and strategies. Investigating whether the curriculum includes components that focus on interpersonal skills, networking, and relationship management is crucial.

Danjuma and Umaru (2017) "Entrepreneurship Skill Acquisition for Wealth Creation of Youths in Agidi Development Area, Nasarawa State." The study investigated how graduate youths can create wealth through acquisition of entrepreneurship skills in Agidi Development Area of Nasarawa State. A total of 511 copies of the questionnaire were disseminated among the respondents, and subsequently, 450 completed questionnaires were collected and subjected to analysis. The findings revealed that most

graduate youths in Agidi Development Area of Nasarawa State lack sufficient entrepreneurial skills and mind-set of self-reliance before coming out from the tertiary institutions. It was recommended among others that Government should furnish section of entrepreneurship education of institutions with human and material resources. Critique the literature may not sufficiently address the inclusivity of entrepreneurship skill acquisition programs, potentially overlooking the needs of underrepresented groups. The literature should have looked into how these programs cater to the diverse demographic composition of Agidi Development Area, ensuring that all youths have equitable access and opportunities.

Mbanefo and Eboka, (2017) stated in their study titled "Acquisition of Innovative and Entrepreneurial Skills in Basic Science Education for Job Creation in Nigeria". The adopted research design was a descriptive survey, encompassing a population consisting of 441 principals and 4340 basic science teachers. Data collection employed a 22-item questionnaire, and mean and standard deviation statistics were applied to address the three RQs. The findings underscored the considerable need for diverse skills in science education to foster job creation. Additionally, teachers were found to be required to utilize practically oriented teaching methods to impart these skills effectively to students. The study also identified various challenges hindering the acquisition of entrepreneurial skills in basic science education. Consequently, the research proposed recommendations based on these findings. The critique of this literature is that it emphasize on short-term outcomes, such as immediate changes in skills or attitudes a focus on short-term effects may not capture the long-term impact of acquiring innovative and entrepreneurial skills on job creation. Longitudinal studies could provide a more comprehensive understanding of the sustained effects over time.

### **Research Gap**

The review examined numerous empirical studies focusing on key attributes such as personality skills, communication skills, human relations skills, management skills, and business skills crucial for entrepreneurial success. A thorough literature analysis unveiled multiple authors recognizing the substantial impact of these skills on entrepreneurial outcomes. The evolving business landscape, coupled with heightened global competition, particularly among small and medium-scale enterprises, underscores the imperative for potential business education students to acquire relevant skills. This acquisition is essential for their future success as job creators upon graduation. Most of the research scrutinized in this study fell short of providing a comprehensive investigation into the specific personality skills, communication skills, human relations skills, management skills, and business skills deemed essential for entrepreneurial success among business education graduates in Kogi State, Nigeria. This identified gap in the existing body of knowledge was addressed by the present study.

### **METHODOLOGY**

The researcher adopted a descriptive research design. This was because descriptive research design aims at exploring opinion of a given population on existing practices and conditions. Primary and secondary source of data was used to elicit information for the study. The data analysis was collected in respect of the bio-data using percentage and the research questions using mean ratings (descriptive statistics).

The study population consists of 150 National Diploma and 50 Higher National Student of Federal Polytechnic, Idah, Kogi State. The sample size was determined by means of random sampling which is a procedure of giving every subject in a population an equal chance of appearing in the selection. Since we are not going to study the whole population, we therefore derived our sample size statistically by applying Taro Yamane formula of (1964) as follows.

$$n = \frac{N}{1 + N(e)^2}$$

Where n = Sample size  
 N = Actual population  
 e = Level of significance (0.05)  
 1 = constant

The sample size thus;

$$n = \frac{200}{1 + 200(0.025)}$$

$$n = \frac{200}{1 + 0.5}$$

$$n = \frac{200}{1.5} = 133$$

This study used both primary and secondary source of data in bringing out Entrepreneurship Skills and Product Innovation in Nigerian Tertiary Institution: a study of Federal Polytechnic, Idah, Kogi State. The level of the significance adopted for the analysis was p = 0.05. This level of significance form the basis for or rejecting or not rejecting each of the hypotheses. The hypotheses were tested using regression analysis with the aid of statistical package for social sciences (SPSS v 20).

**DATA ANALYSIS AND DISCUSSION OF FINDINGS**

Two hundred copies (200) of questionnaires were distributed to the students of Federal Polytechnic Idah, Kogi State and 133 were returned, which form the basis of analysis. Test of hypotheses is done using correlation coefficient as the major technique, with the aid of SPSS version 23.

***Correlations matrix of the Entrepreneurship Skills and Product Innovation in Nigerian Tertiary Institution: A study of Federal Polytechnic, Idah, Kogi State***

Statement	Product Innovation	Operational Skills	Technical Skills	Conceptual Skills	Human or Interpersonal Skills
Product innovation	Pearson Correlation 1 Sig. (2-tailed) N 133				
Operational Skills	Pearson Correlation .954** Sig. (2-tailed) .000 N 133	1 133			
Technical Skills	Pearson Correlation .935** Sig. (2-tailed) .000 N 133	.908** .000	1 133		
Conceptual Skills	Pearson Correlation .935** Sig. (2-tailed) .000 N 133	.908** .000	1.000** .000	1 133	
Human or	Pearson Correlation .902**	.876**	.827**	.827**	1

Interperson	Sig. (2-tailed)	.000	.000	.000	.000	.000
al Skills	N	133	133	133	133	133

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

The table results indicate that the association between operational skills and product innovation is positively and significantly correlated, with a correlation coefficient of  $r = 0.954$  and a p-value of 0.000. Similarly, the relationship between technical skills and product innovation is positive and statistically significant, showing a correlation coefficient of  $r = 0.935$  and a p-value of 0.000. Additionally, the connection between conceptual skills and product innovation is positive and statistically significant, revealing a correlation coefficient of  $r = 0.935$  and a p-value of 0.000. Lastly, the relationship between human or interpersonal skills and product innovation is positive and statistically significant, with a correlation coefficient of  $r = 0.902$  and a p-value of 0.000.

In terms of inter-skill relationships, the connection between technical skills and operational skills is positive and statistically significant, displaying a correlation coefficient of  $r = 0.908$  and a p-value of 0.000. Likewise, the relationship between operational skills and conceptual skills is positive and statistically significant, with a correlation coefficient of  $r = 0.908$  and a p-value of 0.000. Furthermore, the connection between operational skills and human or interpersonal skills is positive and statistically significant, showing a correlation coefficient of  $r = 0.876$  and a p-value of 0.000.

Examining technical skills, a positive and statistically significant relationship is observed with conceptual skills ( $r = 1.000$ , p-value = 0.000) and with human or interpersonal skills ( $r = 0.827$ , p-value = 0.000). Finally, the relationship between conceptual skills and human or interpersonal skills is positive and statistically significant, featuring a correlation coefficient of  $r = 0.827$  and a p-value of 0.000.

### Discussion of Findings

Based on the above facts and figures that has been established in the correlation matrix in the table above, the findings reveal that, there is a significant relationship between operational skills and product innovation with correlation coefficient of  $r = 0.954$  and p value of 0.000. This finding is in agreement with the view of (Najafabadi, et al., 2018) who posits that, operational skills play a crucial role in resource allocation. When operations are streamlined, businesses can allocate resources strategically to support product innovation initiatives. Whether it's funding research and development, hiring skilled personnel, or investing in new technologies, operational efficiency enables a more effective allocation of resources for innovation.

Technical skills has a positive and significant relationship with product innovation with correlation coefficient of  $r = 0.935$  and p value = 0.000, this finding support the view of (Gorshkova, 2018) who buttressed that, technical skills play a crucial role in turning conceptual ideas into tangible prototypes and products. Whether it's engineering, programming, design, or other technical disciplines, proficiency in these skills enables the creation of functional prototypes that can be tested and refined throughout the development process.

There is a significant relationship between conceptual skills and product innovation with correlation coefficient of  $r = 0.935$  and p value = 0.000. From the finding of (Tirmizi, et al., 2020) Conceptual skills involve a willingness to learn and adapt to new information and ideas. Innovators with strong conceptual skills are open to continuous learning, staying informed about industry developments,

technological advancements, and evolving customer preferences. This adaptability is crucial for keeping innovation relevant and sustainable over time.

The relationship between human or interpersonal skills and product innovation was positive and statistically significant with correlation coefficient of  $r = 0.902$  and  $p$  value = 000. From the view of (Racolța-Paina & Muntean, 2020) who buttressed that, successful product innovation often involves cross-functional teams with diverse skills and backgrounds. Strong interpersonal skills facilitate effective communication, collaboration, and teamwork, the ability to work well with others fosters a positive and innovative team environment where ideas can be shared, discussed, and refined collectively.

## CONCLUSION AND RECOMMENDATIONS

In conclusion, this study has provided valuable insights into the intricate relationship between entrepreneurship skills development and product innovation within the Nigerian tertiary education landscape, with a particular focus on Federal Polytechnic, Idah, Kogi State. The findings underscore the significance of entrepreneurship education in shaping students' abilities to think creatively, take risks, and recognize opportunities, thereby fostering a culture of innovation. The positive correlation observed between entrepreneurship skills and product innovation highlights the practical application of acquired knowledge in generating novel ideas and solutions. Students at Federal Polytechnic, Idah, actively engaged in entrepreneurial activities, transcending disciplinary boundaries and contributing to the institution's innovation ecosystem.

The study recommended the followings:

- i. The integration of operational skill development with product innovation in Nigerian tertiary institutions is essential. Establishing internship programs and industry partnerships provides students with real-world exposure to operational challenges.
- ii. The alignment of technical skill development with product innovation is crucial for staying relevant in dynamic industries. Regularly updating technical courses and organizing workshops, hackathons, and competitions help students acquire hands-on experience. This approach ensures that they are well-versed in the latest technologies and can apply technical knowledge creatively to drive product innovation.
- iii. Integrating conceptual skill development with product innovation cultivates a culture of creative thinking. Students who can conceptualize ideas effectively are better positioned to drive innovation. This recommendation contributes to the generation of novel and visionary products, emphasizing the importance of not just technical proficiency but also the ability to envision and articulate innovative solutions.
- iv. Enhancing human/interpersonal skills in conjunction with product innovation involves incorporating soft skills workshops, networking events, and mentorship programs. Collaboration with industry professionals through guest lectures and seminars enriches students' interpersonal skills, fostering effective communication and teamwork.

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