Physics Teachers' Benefits of Entrepreneurship Skills Acquisition

Aishat A. YUSUF
Department of Science Education,
University of Ilorin, Ilorin, Nigeria
yusuf.mf@unilorin.edu.ng

A. O. AKANBI
Department of Science Education,
University of Ilorin, Ilorin, Nigeria

Khadijat S. AMEEN
Department of Science Education,
University of Ilorin, Ilorin, Nigeria

R. E MOHAMMED
Department of Science Education,
University of Ilorin, Ilorin, Nigeria

A. C. KANU
Department of Science Education,
University of Ilorin, Ilorin, Nigeria

Abstract

Physics fuels technological advancement, offering opportunities to acquire skills that drive national development. This study explores the role of entrepreneurship education in addressing unemployment and enhancing the economic security of physics teachers in Kwara State, Nigeria. Recognizing the limitations of curricula focused primarily on white-collar job training, the research emphasizes the need for physics education to integrate entrepreneurial skills that foster innovation, risk management, and self-reliance. A descriptive survey design was employed, targeting 100 senior secondary school physics teachers across Kwara State. The instrument for the data collection was questionnaire validated by three science educators in the department of science education, university of Ilorin, Nigeria, the reliability coefficient was determine using split-half method and Cronbach alpha with 0.86 coefficient which so that the instrument is reliable. The collected data was analysed with descriptive statistics of mean. The findings reveal that entrepreneurship education equips physics teachers with the ability to identify business opportunities, manage risks effectively, and reduce economic hardships. Additionally, it promotes self-reliance and enhances their capacity to create sustainable income-generating ventures. Despite efforts to revise the curriculum in alignment with development goals, gaps persist in practical implementation and empowerment outcomes. The study concludes that entrepreneurship

education is essential for transforming physics teachers into innovators and contributors to Nigeria's socio-economic development. It recommends integrating practical entrepreneurial skills into the physics curriculum, providing teachers with robust risk management training, and equipping them with the tools to become self-reliant and independent professionals.

Keyword: Unemployment, Entrepreneurship, Poverty, Pedagogical knowledge and Science Teachers

Introduction

When analyzing poverty, only looking at unemployment rates will be insufficient and misleading. Instead, job quality – underemployment, people's specific activities and occupations and markers of formality is fundamental for understanding the labour market. The International Labour Organization (ILO) has projected a global unemployment rate of 5.2% in 2024, slightly higher than the 5.1% in 2023. In the case of a country like Nigeria, unemployment has proved a difficult statistic to interpret. Nigeria's unemployment rate stood at 33.3 percent in Q4 of 2024. However, the National Bureau of Statistics (NBS) recently reported unemployment rates of 5.3 percent (Q4 2022) and 4. 1 percent (Q1 2023) based on the new Nigeria Labour Force Survey (NLFS). Different government regimes have made many attempts to reduce unemployment by generating jobs in the public and private sectors through the diverse development agenda, but the problems seem to be unabated. It is common knowledge that about 80% of graduates in most Nigerian universities find it hard to get employment every year. This is largely due to the curricula of the universities and other tertiary schools with emphasis on training for white-collar jobs (Adewolu 2024; Osaat & Emujakporue, 2024).

Physics is a branch of science that deals with energy and matter and their interactions. It is sometimes referred to as the science of measurement and its knowledge has contributed greatly to the production of instruments and devices of tremendous benefits to the human race, also, the knowledge of physics plays a very significant role in the economic development of the nation. In Nigeria, physics is taught as one of the science subjects at the senior secondary school level, in order to familiarize them with the trend of modern developments which can be achieved if the physics syllabus is implemented effectively according to Akinseye (2023), therefore, objective of any level of education cannot be achieved if the planned program for such level of education is not well implemented. No matter how well a curriculum of any subject is planned, designed and

documented, implementation is important (Wanti & Chastanti, 2023; Chiu & Chai, 2020; O'neill, 2015; Ball & Bowe, 1992). This is because the problem of most programmes arises at the implementation stage. Implementation in its simplicity is the process of moving an idea from concept to reality. Implementation help a learner to develop competencies needed for firm entrepreneurial commitments such as setting up business, marketing, and services or being productive, wealth creators, employers of labour and self-reliant thereby contributing in nation building (Ajayi & Udeh, 2024; Miço & Cungu, 2023).

The physics curriculum was reviewed by the federal government of Nigeria in 2008 to be in line with the Millennium Development Goals (MDGs) and National Economic Empowerment and Development Strategy (NEEDS). The National Economic Empowerment and Development Strategy (NEEDS) is a socio-economic framework designed to enable sustainable human development in Nigeria. It incorporates the basic targets of the Millennium Development Goals (MDGs) into government policy at both the national and grassroots levels. Although Nigeria has made appreciable progress in achieving the MDGs, challenges still remain. The reviewed curriculum which aimed at national entrepreneurship development did little or nothing to improve the situation at hand where the Nigerian government is still seen as the sole provider of employment to the teeming population of 229.15million appropriately estimated people (Okori, & Ebere, 2019; Agommuoh & Joseph-Kalu, 2020).

Entrepreneurship is the act of identifying, initiating, organizing and bringing a vision to life, be it a new product, service, process, organizational strategy, promotional or a niche market, (Sapiro, 2024; Guha, Karmakar & Priyadarsinee, 2024; Rajagopal & Rajagopal, 2021). Each academic year, Nigeria produces approximately 600,000 graduates, unfortunately, this has led to a significant increase in the number of unemployed youths annually. This can be caused by Mismatched Skills- Many recent graduates lack skills suitable for their desired roles. Some candidates applying for jobs are unaware of the positions they're interviewing for, Lack of Work Experience: While formal employment is challenging, opportunities like internships, volunteering, and apprenticeships provide hands-on experience. Employability Skills: Employers now prioritize specific skills over educational background. Acquiring relevant skills is crucial for success in today's job market (Tushar & Sooraksa. 2023; García-Pérez et al 2021; Finch et al 2016), entrepreneurial education in the university become crucial to enable physics graduates create job instead of job seekers. National Population Commission (2013) revealed that only one in every ten

graduates (physics graduates inclusive) in Nigeria get a job. It is therefore imperative that teachers should teach students in such a way that they acquire entrepreneurship skills for them to be self-employed after graduation.

Entrepreneurship education seeks to provide students with the knowledge, skills, and motivation to encourage entrepreneurial success in various settings. Its objectives are; it focuses on developing skills and attributes that enable the realization of opportunities, unlike traditional management education (which emphasizes operating existing hierarchies), entrepreneurship education encourages creativity, innovation, and risk-taking and it aims to foster an entrepreneurial mindset, whether students start new businesses or contribute to existing organizations. This can be offered at all levels of schooling, from primary to graduate programs, it has three approaches; regular, active-based programmes and corporate entrepreneurship (intrapreneurship) (Bodolica & Spraggon 2021; Ghafar, 2020; Arnaut, 2020; Manimala & Thomas 2017). Students, particularly those at the bachelor's level- undergraduate, need to develop strong entrepreneurial skills to enhance their career prospects. A solid foundation in entrepreneurial thinking will better equip them to make informed decisions when choosing educational or career pathways, ultimately increasing their chances of success in diverse fields.

Purpose of the Study

The main purpose of this study is to investigate the level of the physics teachers on acquisition of entrepreneurship skills and to re-orientate physics teachers. Specifically, the study will investigate:

1. innovative opportunities that acquisition of entrepreneurship skills will offer physics teachers
2. risk management training that acquisition of entrepreneurship skills can offer physics teachers
3. unemployment implications that acquisition of entrepreneurship skills can curb physics teachers off.
4. empowerment inclusion in the curriculum that acquisition of entrepreneurship skills can offer physics teachers

Research Questions

The following research questions were answered in the study:

1. What are the, innovative opportunities that acquisition of entrepreneurship skills will offer physics teachers?
2. What are the risk management training that acquisition of entrepreneurship skills can offer

physics teachers?

3. What are the unemployment implications that acquisition of entrepreneurship skills can curb physics teachers off?
4. What are the empowerment inclusion in the curriculum that acquisition of entrepreneurship skills can offer physics teachers?

Methodology

This study adopted a descriptive survey design. This survey research approach was used as a way of employing questionnaire in order to determine the opinions attitudes factors, preferences and perceptions of interest to the research. Hence, this survey design is used to give physics teachers a pedagogical reorientation towards the acquisition of entrepreneurship skills in the teaching of physics. The population of this study involved the senior secondary school physics teachers in Kwara State. 100 secondary schools (10 public and private school in each five local governments - Ilorin west, Ilorin East, Ilorin south, Ifelodun, and Asa) that is twenty (20) senior secondary school physics teachers each in five local governments were selected and 100 physics teachers sampled. Simple random sampling techniques was used to choose one physics teacher in each school visited, considering the fact that most secondary schools have more than one physics teacher. The instrument for data collection was closed ended questionnaire consists of five sections which are, Section A, B, C, D and E. Section A contains questions on the personal/demographic information of each respondent, section B contains questions on teachers perception on acquisition of skills and training by young physics graduates, section C contains questions on perception of teachers on risk management among young physics graduates, section D contains questions on perception of teachers on how entrepreneurship reduces poverty and violence, section E contains questions on perception of physics teachers on how young physics graduates can be empowered and independent through entrepreneurship.

Face and content validities of the instrument were ascertained by three science educators in the Department of Science Education, University of Ilorin, Nigeria and the corrected version was used to collect data. To determine the reliability of the instrument, the questionnaire was administered to twenty respondents who were not part of the participants. The internal consistency of each scale was determined by split-half method at level of significance 0.05 and the Cronbach

Alpha, 0.86 was determined which implies the instrument is reliable. The collected data was analysed with descriptive statistics of mean.

Results

Research Question One: What are the innovative opportunities that acquisition of entrepreneurship skills will offer physics teachers?

Table 1: Innovative opportunities that acquisition of entrepreneurship skills will offer physics teachers

S/N	Items	SA	A	D	SD	MEAN	Ranks
1	Consciousness to identify various business opportunities for physics teachers	45 (45.0%)	55 (55.0%)	0 (0.0%)	0 (0.0%)	3.45	1st
2	Provisions of adequate training and teaching on what to do and what not to do as regards to business for the physics teachers	40 (40.0%)	40 (40.0%)	20 (20.0%)	0 (0.0%)	3.25	3rd
3	Creativity and innovative ideas when dealing with business activities by the physics teachers	40 (40.0%)	60 (60.0%)	0 (0.0%)	0 (0.0%)	3.40	2nd
4	A catalyst for the creation of an effective and efficient business physics teacher	35 (35.0%)	50 (50.0%)	15 (15.0%)	0 (0.0%)	3.20	4th

Table 1 shows the perception of the business opportunity innovative and training available for physics teachers. It revealed that acquisition of entrepreneurship skills can help physics teacher to be able to identify the conscious of each identify physics business opportunities.

Research Question Two: What are the risk management training that acquisition of entrepreneurship skills can offer physics teachers?

Table 2: Risk management training that acquisition of entrepreneurship skills will offer physics teachers

S/N	Items	SA	A	D	SD	MEAN	Ranks
1	Acquisition of entrepreneurship skills enable young physics teachers to articulate his or her risk appetite and define	25 (25.0%)	70 (70.0%)	5 (5.0%)	0 (0.0%)	3.20	3rd

	his or her risk tolerances for effective business operation						
2	Acquisition of entrepreneurship skills provide young physics teachers with management and the board information they need about the top risks and how they are managed	35 (35.0%)	65 (65.0%)	0 (0.0%)	0 (0.0%)	3.35	1st
3	Acquisition of entrepreneurship skills provide young physics teachers with requisite skills regarding critical risk issues on a timely basis for an effective risk oversight	30 (30.0%)	55 (55.0%)	3 (15.0%)	0 (0.0%)	3.15	4th
4	Acquisition of entrepreneurship skills enable young physics teachers to be prepared to respond to extreme events by prioritizing its high impact effect	35 (35.0%)	60 (60.0%)	5 (5.0%)	0 (0.0%)	3.30	2nd

Table 3 shows the ways used to offer physics teachers adequate training in risk management. It revealed that acquisition of entrepreneurship skills provide physics teachers with management and the board information they need about the top risks and how they are managed, enables physics teachers to be prepared to respond to extreme events by prioritizing its high impact effect and enable physics teachers to articulate his or her risk appetite and define his or her risk tolerances for effective business operation.

Research Question Three: What are the unemployment implications that acquisition of entrepreneurship skills can curb physics teachers off?

Table 3: Unemployment implications that acquisition of entrepreneurship skills can curb physics teachers off

S/N	Items	SA	A	D	SD	MEAN	Ranks
1	Acquisition of entrepreneurship skills reduce the problem of economic hardship for young physics teachers	50 (50.0%)	50 (50.0%)	0 (0.0%)	0 (0.0%)	3.50	1st

2	Acquisition of entrepreneurship skills requires greater workplace flexibility and paid time off in order to increase economic security	45 (45.0%)	45 (45.0%)	10 (10.0%)	0 (0.0%)	3.35	2nd
3	Acquisition of entrepreneurship skills greatly increase social security by reducing poverty and economic insecurity among the physics teachers	45 (45.0%)	45 (45.0%)	10 (10.0%)	0 (0.0%)	3.35	2nd
4	Acquisition of entrepreneurship skills reduce the rate of ravishment, rape, violation, violence and injustice of any form among young physics teachers	40 (40.0%)	35 (35.0%)	15 (15.0%)	10 (10.0%)	3.05	4th

Table 3 shows the answer to research question three "What are the unemployment implications that acquisition of entrepreneurship skills can curb physics teachers off". It revealed that acquisition of entrepreneurship skills reduce the problem of economic hardship for physics teachers, requires greater workplace flexibility and paid time off in order to increase economic security and greatly increase social security by reducing poverty and economic insecurity among the physics teachers.

Research Question Four: What are the empowerment inclusion in the curriculum that acquisition of entrepreneurship skills can offer physics teachers?

Table 4: Empowerment inclusion in the curriculum that acquisition of entrepreneurship skills can offer physics teachers

S/N	Items	SA	A	D	SD	MEAN	Rank
1	Acquisition of entrepreneurship skills provide physics teachers with enough training that will enable them to be well empowered and self-reliant people in their own right	40 (40.0%)	60 (60.0%)	0 (0.0%)	0 (0.0%)	3.40	1st

2	Entrepreneurship training enrich physics teachers with perception of his or her possibilities of obtaining and maintaining a business atmosphere	30 (30.0%)	70 (70.0%)	0 (0.0%)	0 (0.0%)	3.30	3rd
3	Acquisition of entrepreneurship skills provide physics teachers with business training background which prepares them to deal efficiently and effectively with everyday problems	30 (30.0%)	70 (70.0%)	0 (0.0%)	0 (0.0%)	3.30	3rd
4	Entrepreneurship training enable physics teachers in acquiring self-dependence in mostly all aspect of life	40 (40.0%)	50 (50.0%)	10 (10.0%)	0 (0.0%)	3.30	2nd

Table 4 shows the answer to research question four "What are the educational functionalities that would make physics teachers empowered and self-reliant people on their own? It revealed that acquisition of entrepreneurship skills provide physics teachers with enough training that will enable them to be well empowered and self-reliant people in their own right, it enables physics teachers in acquiring self-dependence in mostly all aspect of life and enrich physics teachers with perception of his or her possibilities of obtaining and maintaining a business atmosphere.

Discussion of Findings

The result obtained from this study indicated that acquisition of entrepreneurship skills help physics teachers to be self-reliant and self-employed, enables physics teachers to be conscious and able to identify various business opportunities and enable the physics teachers to be creative and innovative when dealing with business activities. This finding is in line with the submission of Komolafe et al (2020) that entrepreneurship skill is the ability to create something new with value by devoting the necessary time and effort, assuming the accompanying financial, psychic and social risks, and receiving the resulting rewards of monetary and personal satisfaction and independence.

This study equally discovered that acquisition of entrepreneurship skills provides physics teachers with management and the board information they need about the top risks and how they

are managed, enables physics teachers to be prepared to respond to extreme events by prioritizing its high impact effect and enable physics teachers to articulate their risk appetite and define their risk tolerances for effective business operation. The finding of this study agrees with the view of Klassen and Chiu (2010) that entrepreneurship skills are: sales and marketing; financial know how; self- motivation skill; time management skill and administrative skills. The implication of this is that the understanding and acquisition of essential entrepreneurial skills are necessary tools in physics teacher education. These will help improve the development of managerial competence in physics education teachers thus will automatically increase their employability level.

The result of this study shows that acquisition of entrepreneurship skills reduce the problem of economic hardship for physics teachers, requires greater workplace flexibility and paid time off in order to increase economic security and greatly increase social security by reducing poverty and economic insecurity among the physics teachers. This agrees with the view of Adeyemi (2021) that entrepreneurship education propels very progressive, prosperous, dynamic and sustainable economics not minding that it takes lot of personal efforts, idea, patience, researches, self-development and training. Aruma (2009) explained that entrepreneurship education reduces poverty, creates wealth, generates employment and enhances local production of goods and services. Thus, entrepreneurship education produces self-reliant teachers who can utilize the skills they have acquired in the course of their study to establish personal businesses that will put food on their tables.

This study found that acquisition of entrepreneurship skills provide physics teachers with enough training that will enable them to be well empowered and self-reliant people in their own right, It enables physics teachers in acquiring self-dependence in mostly all aspect of life and enrich physics teachers with perception of their possibilities of obtaining and maintaining a business atmosphere. This finding agrees with the submission of Adekunle and Kayode (2014) that entrepreneurship skills can be said to be the skills of exploiting the opportunities that exist in the environment in an attempt to create value. Thus, it could be explained that entrepreneurship skill is the ability of an individual to exploit an idea and create an enterprise not only for personal gain but also for social and developmental gain.

Conclusion

This study underscores the transformative potential of entrepreneurship education for physics teachers in Nigeria. By equipping teachers with entrepreneurial skills, we can address pressing

economic challenges such as unemployment and poverty. The findings reveal that these skills not only enhance teachers' self-reliance and innovation but also significantly reduce economic insecurity. Despite varied teaching experiences, the positive impact of entrepreneurship education remains consistent across the board. Integrating entrepreneurial training into the science curriculum empowers teachers, fosters creativity, and prepares them to navigate and mitigate risks effectively. Ultimately, this approach bridges the gap between pedagogical knowledge and practical economic empowerment, contributing to a more sustainable and prosperous future for physics educators and their communities. Embracing entrepreneurship in education is not merely an option but a necessity for fostering resilience and economic growth in Nigeria.

Recommendations

Based on the findings from this study, this study recommends that:

i. Physics teachers should be exposed to the necessary skills needed to be self-reliant.
ii. Physics education curriculum should accommodate practical skills for the future physics teachers.
iii. Physics education should be designed to provide physics teachers with adequate training in risk management.

References

Adekunle, S. O & Kayode, D. J (2014). Entrepreneurship education in Nigerian universities: A tool for National transformation. Asia pacific Journal of educators and education, 29, 155-175

Adewolu, O. A. (2024). *Higher Education, skills development and students' preparedness for employability: a case study of the University of Lagos, Nigeria (towards a sustained practice approach with the triple helix model of innovation)* (Doctoral dissertation, UCL (University College London)).

Adeyemi, S. O. (2021). *Effect of Entrepreneurial Development on Job Creation among Undergraduate Students in Selected Universities in Ogun State, Nigeria* (Doctoral dissertation, Kwara State University (Nigeria))

Agommuoh, P. C., & Joseph-Kalu, N. (2020). Acquisition of Entrepreneurial Skills: A Pedagogical Re-orientation for Physics Teachers. *Rivers State University Journal of Education*, *23*(1&2), 190-199.

Ajayi, F. A., & Udeh, C. A. (2024). Review of workforce upskilling initiatives for emerging technologies in IT. *International Journal of Management & Entrepreneurship Research*, *6*(4), 1119-1137.

Akinseye, M. O. (2023). *Perception of Physics teachers on the Availability and Utilization of Improvised Instructional Materials in Secondary Schools in Bosso, Minna Niger state* (Doctoral dissertation).

Arnaut, D. (2020). From a Traditional to an Entrepreneurial University: Entrepreneurial Education and Opportunities. In *Handbook of Research on Enhancing Innovation in Higher Education Institutions* (pp. 142-165). IGI Global.

Aruma, E. O. (2009). The role of entrepreneurship education in promoting Community development enterprises in Nigeria. African journal of Educational research and development, 3(2), 189-194

Ball, S. J., & Bowe, R. (1992). Subject departments and the 'implementation of National Curriculum policy: an overview of the issues. *Journal of curriculum studies*, *24*(2), 97-115.

Bodolica, V., & Spraggon, M. (2021). Incubating innovation in university settings: building entrepreneurial mindsets in the future generation of innovative emerging market leaders. *Education+ Training*, *63*(4), 613-631.

Chiu, T. K., & Chai, C. S. (2020). Sustainable curriculum planning for artificial intelligence education: A self-determination theory perspective. *Sustainability*, *12*(14), 5568.

Finch, D. J., Peacock, M., Levallet, N., & Foster, W. (2016). A dynamic capabilities view of employability: Exploring the drivers of competitive advantage for university graduates. *Education+ Training*, *58*(1), 61-81.

García-Pérez, L., García-Garnica, M., & Olmedo-Moreno, E. M. (2021). Skills for a working future: How to bring about professional success from the educational setting. *Education sciences*, *11*(1), 27.

Ghafar, A. (2020). Convergence between 21st century skills and entrepreneurship education in higher education institutes. *International Journal of Higher Education*, *9*(1), 218-229.

Guha, S., Karmakar, S., & Priyadarsinee, S. (2024). Entrepreneurship in Extension. *Jyotishree Anshuman*, 99.

Klassen, R. M., & Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of educational Psychology*, *102*(3), 741.

Komolafe, B. F., Ogunniran, M. O., Zhang, F. Y., & Qian, X. S. (2020). A Comparative Perspective of Teaching Skill Acquisition in Pre-Service Physics Teacher (PSPT) Training Program in China and Nigeria. *Journal of Baltic Science Education*, *19*(3), 356-373.

Manimala, M. J., & Thomas, P. (2017). Entrepreneurship education: innovations and best practices. *Entrepreneurship education: Experiments with curriculum, pedagogy and target groups*, 3-53.

Miço, H., & Cungu, J. (2023). Entrepreneurship education, a challenging learning process towards entrepreneurial competence in education. *Administrative Sciences*, *13*(1), 22.

National Population Commission. (2013). *Nigeria demographic and health survey 2013*. National Population Commission, ICF International.

Okori, O. A., & Ebere, O. J. (2019). Science and mathematics education as tools for developing entrepreneurship skills among secondary school students in cross river state, Nigeria. *Global Journal of Educational Research*, *18*(1), 34-45.

O'neill, G. (2015). Curriculum design in higher education: Theory to practice.

Osaat, D. S., & Emujakporue, E. (2024). Managing Higher Education for Unemployment Reduction in Achieving Sustainable Development in Nigeria. *Journal of Education in Developing Areas*, *31*(5), 80-90.

Rajagopal, A., & Rajagopal, A. (2021). Entrepreneurship and Markets. *Epistemological Attributions to Entrepreneurial Firms: Linking Organizational Design and Operational Efficiency*, 91-118.

Sapiro, A. (2024). Entrepreneurship and innovation. In *Strategic Management: Fundamental Concepts for Decision Making and Strategy Execution* (pp. 373-399). Cham: Springer International Publishing.

Tushar, H., & Sooraksa, N. (2023). Global employability skills in the 21st century workplace: A semi-systematic literature review. *Heliyon*

Wanti, L., & Chastanti, I. (2023). Analysis of preparation in the independent curriculum implementation: Case study on IPAS learning. *BIO-INOVED: Jurnal Biologi-Inovasi Pendidikan*, *5*(2), 250-258.