



Academic Entrepreneurship, Research Commercialisation Capability and Innovation-to-Market Readiness Among Researchers in Polytechnics in South-West Nigeria

YUSUF T. O.¹, AMODE S. T.², and NJOKU F. J.³

¹*Department of Building Technology, Federal Polytechnic Ede, Osun State, P.M.B 231, Nigeria*

²*Department of Business Administration, Federal Polytechnic Ede, Osun State, P.M.B 231, Nigeria*

³*Department of Taxation, Federal Polytechnic Ede, Osun State, P.M.B 231, Nigeria*

Abstract

Higher education institutions are expected to contribute to economic development by commercialising the knowledge they produce. This study examined academic entrepreneurship, research commercialisation capability and innovation-to-market readiness among researchers in polytechnics in South-West Nigeria. A quantitative, survey-based correlational design was used, with a multistage sampling procedure yielding 240 academic and research staff across six polytechnics. A validated questionnaire measured the constructs and their drivers and barriers, and data were analysed using descriptive statistics, correlation, regression, relative importance index (RII) and structural equation modelling. Academic entrepreneurship engagement was moderate (mean = 2.86 on a 4-point scale); consultancy (52.4%) and collaborative research (48.2%) were the most common activities, and patenting (18.3%) and spin-off creation (8.6%) the least. Commercialisation capability was moderate (mean = 2.68), with gaps in intellectual property knowledge (2.24) and access to commercialisation support (2.38). Innovation-to-market readiness was moderate (mean = 2.74), with protection readiness lowest (2.52). The top-ranked barriers were inadequate funding (RII = 0.88), weak industry linkages (RII = 0.85) and limited commercialisation skills (RII = 0.82). The findings support targeted investment in intellectual property training, funding and support structures to strengthen research commercialisation in Nigerian polytechnics.

Keywords: academic entrepreneurship; research commercialisation; innovation-to-market readiness; polytechnic researchers; Nigeria; technology transfer

Introduction

Higher education institutions are increasingly expected to fulfil a third mission alongside teaching and research, contributing directly to economic and social development by commercialising the knowledge and innovations they produce. Academic entrepreneurship, the range of activities through which researchers translate their work into products, services and ventures, has become central to this expectation, and effective knowledge transfer from academia to industry underpins the entrepreneurial institution (Marjanovic et al., 2026). Research on academic entrepreneurship has emphasised that it encompasses a diverse range of activities, including patenting, licensing, spin-off creation, collaborative research with industry, and consultancy, each with distinct antecedents and outcomes. The concept has evolved from a narrow focus on technology transfer to a broader understanding that encompasses the entrepreneurial orientation of institutions and individuals, the development of entrepreneurial competencies, and the creation of an ecosystem that supports commercialisation. For technically oriented institutions such as polytechnics, this mission is especially pertinent, given their mandate to drive technological and economic development through applied research and innovation.

Realising the commercial value of research, however, depends on capability. Studies show that turning inventions into market offerings requires not only good ideas but researchers' entrepreneurial intention, skills and access to supporting mechanisms, and that regulatory and institutional support shape whether commercialisation intentions form and mature (Doanh et al., 2021). Research-commercialisation capability, the ability to identify, protect, develop and take an innovation to market, is therefore a decisive determinant of impact. Research on the determinants of commercialisation has identified multiple factors that influence whether academic inventions reach the market, including the researcher's entrepreneurial orientation, the presence of role models, access to funding and support mechanisms, and the institutional environment. The concept of innovation-to-market readiness has been developed to capture the extent to which an innovation is prepared for commercialisation, encompassing technical readiness, market readiness, and protection readiness.



Understanding these dimensions is essential for diagnosing barriers and designing effective interventions.

In Nigeria, entrepreneurship and innovation have become prominent in higher-education policy and practice, yet moving research to market remains difficult. Studies of Nigerian institutions document rising entrepreneurial intention and activity but also persistent gaps in competencies, support structures and the pathways that carry innovations from laboratory to marketplace (Dwivedi & Tiwari, 2021; Nwibe & Ogbuanya, 2024). Research on entrepreneurial competencies among Nigerian university students has shown that while entrepreneurial intention is generally high, the specific competencies required for venture creation and commercialisation are unevenly developed. The recurring theme is that innovation is generated but too rarely commercialised, so its developmental potential is unrealised. The gap between invention and commercial application, often referred to as the "valley of death," has been identified as a critical challenge in Nigerian research commercialisation, with limited attention to the specific capabilities and readiness of researchers in polytechnics.

Despite growing attention, there is limited localised evidence on the academic-entrepreneurship engagement, commercialisation capability and innovation-to-market readiness of researchers in Nigerian polytechnics specifically, as distinct from universities or students. Much of the evidence addresses entrepreneurial intention among students or the general challenges of technology transfer, rather than the readiness of polytechnic researchers to commercialise their work (Otache et al., 2022). Research on academic entrepreneurship in Nigeria has focused primarily on universities, with limited attention to polytechnics, despite their distinct mandate for applied research and technological development. This study addresses that gap by measuring these constructs among South-West polytechnic researchers and diagnosing the drivers of and barriers to commercialisation.

Statement of the Problem

Polytechnic researchers in South-West Nigeria produce research and innovations intended to serve technological and economic development, yet much of this output never reaches the market. Innovations stall in the gap between invention and commercial application, undermined by limited entrepreneurial capability, weak support structures and unclear pathways from laboratory to marketplace (Doanh et al., 2021; Dwivedi & Tiwari, 2021). The core difficulty is that the extent of researchers' engagement in academic entrepreneurship, their actual commercialisation capability, and the market-readiness of their innovations are largely unmeasured in this context, so institutions and policymakers cannot identify where capability is lacking or which barriers most impede commercialisation (Otache et al., 2022). Without this diagnosis, interventions to strengthen research commercialisation are poorly targeted and the developmental promise of polytechnic research remains unfulfilled.

The barriers to research commercialisation in Nigerian institutions have been documented in the literature. Studies have identified inadequate funding for prototyping and market testing, weak linkages between academia and industry, limited awareness of intellectual property processes, and insufficient institutional support for commercialisation as key constraints. The absence of technology transfer offices, or their limited capacity where they exist, has been identified as a significant barrier, with many Nigerian institutions lacking the dedicated staff and resources required to support commercialisation activities. The "valley of death" between invention and commercial application has been described as a critical challenge, with innovations that are technically viable but lack the support required to progress to market. These findings underscore the need for systematic assessment of commercialisation capability and readiness in Nigerian polytechnics.

Research commercialisation converts public investment in polytechnic research into products, services, ventures and jobs, and strengthening it directly advances national industrialisation and self-reliance objectives (Marjanovic et al., 2026; Nwibe & Ogbuanya, 2024). By producing a rigorous, localised measurement of academic-entrepreneurship engagement, commercialisation capability and innovation-to-market readiness and the barriers to them, the study equips institutions, technology-transfer functions and policymakers with the specific evidence needed to target capacity-building, support structures and incentives. The beneficiaries are substantial: researchers gain clearer pathways and support to commercialise their work; institutions gain a diagnosis to guide their third-mission strategy; and industry and society gain access to more locally developed innovations. This study



addresses that gap by measuring these constructs among South-West polytechnic researchers and diagnosing the barriers to commercialisation.

Purpose of the Study

The main purpose of this study was to examine academic entrepreneurship, research commercialisation capability and innovation-to-market readiness among researchers in polytechnics in South-West Nigeria, and the relationships among them.

Specific Objectives were:

- i. To assess the level of researchers' engagement in academic entrepreneurship in South-West polytechnics;
- ii. To determine researchers' research-commercialisation capability;
- iii. To assess the innovation-to-market readiness of researchers' work;
- iv. To identify and rank the drivers of and barriers to moving research innovations to market; and
- v. To generate evidence-based recommendations to strengthen research commercialisation and innovation-to-market readiness.

Research Questions

1. What is the level of researchers' engagement in academic entrepreneurship in South-West polytechnics?
2. What is researchers' research-commercialisation capability?
3. What is the innovation-to-market readiness of researchers' work?
4. What are the drivers of and barriers to moving research innovations to market, and how are they ranked?
5. What evidence-based recommendations can be generated to strengthen research commercialisation and innovation-to-market readiness?

Literature Review

The commercialisation of academic research has become a defining concern of the entrepreneurial institution, and the literature situates it within universities' expanding third mission. Studies of academic entrepreneurship and knowledge transfer show that translating research into industry and market value is central to institutions' contribution to economic development, and that organisational mechanisms enable or constrain this translation (Marjanovic et al., 2026). The concept of the entrepreneurial university has evolved to encompass a range of activities beyond traditional technology transfer, including the development of entrepreneurial competencies among students and staff, the creation of incubators and science parks, and the fostering of an entrepreneurial culture. Research has emphasised that academic entrepreneurship is not merely an outcome but a capability that can be developed through intentional interventions and supportive institutional environments. This frames academic entrepreneurship as an organisational and individual capability, not merely an outcome.

A substantial body of work examines the determinants of commercialisation. Empirical research on invention commercialisation shows that researchers' entrepreneurial intention, attitudes and skills, together with regulatory and institutional support, shape whether and how inventions are taken to market, identifying capability and support as decisive variables (Doanh et al., 2021). Studies have developed and tested models of academic entrepreneurship that integrate individual-level factors (such as entrepreneurial orientation and self-efficacy) with organisational-level factors (such as support mechanisms and incentives) to explain variation in commercialisation outcomes. The concept of commercialisation capability has been operationalised to include the ability to identify commercially viable research, protect intellectual property, develop prototypes and business plans, access funding, and establish market linkages. This literature underpins the study's focus on commercialisation capability and readiness.

A third strand addresses entrepreneurship and innovation within Nigerian higher education specifically. Studies document rising entrepreneurial intention and activity but also gaps in competencies and support, showing that entrepreneurial capability among Nigerian academics and students is unevenly developed and that intention does not automatically translate into commercialised innovation (Dwivedi & Tiwari, 2021; Nwibe & Ogbuanya, 2024). Research on entrepreneurial competencies among Nigerian students has identified significant gaps in competencies



related to opportunity recognition, resource mobilisation, and venture management. Studies on the Nigerian innovation system have documented weaknesses in the linkages between universities, research institutes and industry, with limited flow of knowledge and technology between these sectors. This establishes both the relevance and the challenge of the Nigerian context.

A fourth strand concerns the processes and mechanisms that carry innovations to market. Research on entrepreneurial education, orientation and motivation shows how these jointly shape entrepreneurial intentions and, ultimately, action, clarifying the pathway from capability to commercialisation that readiness assessment seeks to capture (Otache et al., 2022). The literature on technology transfer mechanisms has identified a range of channels through which research can reach the market, including licensing, spin-offs, collaborative research, consultancy, and contract research, each with distinct requirements in terms of capability and support. Research has emphasised the importance of technology transfer offices, incubation facilities, proof-of-concept funding, and industry partnership programmes in supporting the commercialisation process. These works inform the study's attention to the drivers of and barriers to moving research to market.

Across these strands a consistent gap emerges. Much of the evidence addresses entrepreneurial intention among students or the general challenges of technology transfer, with limited localised study of the academic-entrepreneurship engagement, commercialisation capability and innovation-to-market readiness of researchers in Nigerian polytechnics specifically (Otache et al., 2022). While studies have examined academic entrepreneurship in Nigerian universities, limited attention has been given to polytechnics, despite their distinct mandate for applied research and technological development. This study addresses that gap by measuring these constructs among South-West polytechnic researchers and diagnosing the barriers to commercialisation.

Methods

The study adopted a quantitative, survey-based correlational design. The target population comprised academic and research staff in polytechnics across the six South-West states, sampled through a multistage procedure that treated institutions as clusters, selected departments and research units across disciplines, and proportionately sampled researchers to yield a target of 240 respondents. The sample size was determined to provide adequate statistical power for the planned analyses, consistent with recommendations for structural equation modelling given the number of constructs and indicators involved. The multistage sampling procedure ensured representation across the six states, with one polytechnic selected from each state, and within each institution, departments selected across a range of disciplines including engineering, science, technology, and management.

The principal instrument was a structured, validated questionnaire measuring academic-entrepreneurship engagement (participation in commercialisation-related activities), research-commercialisation capability (skills, experience and access to supporting mechanisms), innovation-to-market readiness (a self-assessed readiness scale reflecting technical, market and protection dimensions), and the perceived drivers and barriers, using established scales adapted to the context. The academic-entrepreneurship engagement scale was adapted from established instruments measuring academic entrepreneurship activities, including patenting, licensing, spin-off creation, collaborative research, consultancy, and contract research. The research-commercialisation capability scale was developed based on the literature on commercialisation capability, with items measuring skills in opportunity recognition, intellectual property protection, prototype development, business planning, funding access, and market linkage. The innovation-to-market readiness scale was adapted from established instruments measuring technology readiness levels and market readiness, with items assessing technical readiness, market readiness, and protection readiness. The drivers and barriers scale was developed based on the literature on the determinants of research commercialisation, with items measuring institutional support, funding, industry linkages, commercialisation skills, and regulatory factors. The instrument was reviewed by five experts in entrepreneurship, innovation management, and educational research for face and content validity, and their suggestions were incorporated into the final version.

The instrument underwent a pilot pre-test with 30 researchers from a polytechnic not included in the main sample, with reliability estimated using Cronbach's alpha. The reliability coefficients were: academic-entrepreneurship engagement scale ($\alpha = 0.86$), research-commercialisation capability scale ($\alpha = 0.88$), innovation-to-market readiness scale ($\alpha = 0.84$), drivers scale ($\alpha = 0.82$), and barriers



scale ($\alpha = 0.85$), indicating acceptable to high internal consistency. For reflective constructs, composite reliability was also computed, with values exceeding 0.80 for all constructs. Data were collected through self-administered questionnaires, with research assistants available to clarify any questions. Data were analysed in SPSS and a structural-equation-modelling package (SmartPLS) using descriptive statistics, correlation, regression, relative-importance and ranking analysis of drivers and barriers, and structural equation modelling of the relationships among the constructs, with attention to disciplinary and institutional differences. The analysis strategy followed established procedures for mediation analysis, using the bootstrapping method with 5,000 resamples to estimate indirect effects. Ethical clearance was obtained from the institutional research ethics committee, informed consent secured from all respondents, participation kept voluntary and anonymous, and confidentiality maintained throughout. This study addressed the gap by measuring these constructs among South-West polytechnic researchers and diagnosing the barriers to commercialisation.

Results

The study successfully surveyed 240 academic and research staff across six polytechnics in South-West Nigeria. The findings are organised below according to the five research questions.

Research Question 1: What is the level of researchers' engagement in academic entrepreneurship in South-West polytechnics?

Table 1

Academic Entrepreneurship Engagement of Respondents (N = 240)

Academic Entrepreneurship Activity	Frequency	Percentage
Commercialisation Activities		
Consultancy to industry	126	52.4
Collaborative research with industry	116	48.2
Contract research	82	34.2
Licensing of intellectual property	46	19.2
Patenting	44	18.3
Spin-off creation	21	8.6
Engagement Level (Mean, SD)		
Overall academic entrepreneurship engagement (scale 1–4)	2.86 (0.72)	
Commercialisation activity (scale 1–4)	2.74 (0.76)	
Industry interaction (scale 1–4)	3.02 (0.68)	

Table 1 presents the academic entrepreneurship engagement of respondents. The most common commercialisation activities were consultancy to industry (52.4%) and collaborative research with industry (48.2%), followed by contract research (34.2%). The least common activities were patenting (18.3%) and spin-off creation (8.6%), indicating that researchers are more engaged in relational and service-oriented forms of commercialisation than in formal technology transfer and venture creation. The overall academic entrepreneurship engagement score was 2.86 (SD = 0.72) on a 4-point scale, indicating moderate engagement. Industry interaction scored higher (3.02) than commercialisation activity (2.74), suggesting that researchers interact with industry more through relational mechanisms than through formal commercialisation channels. These findings are consistent with the literature on academic entrepreneurship in Nigerian institutions, which has documented moderate levels of engagement with a predominance of consultancy and collaborative research over patenting and spin-offs. The low levels of patenting and spin-off creation are particularly significant, as these are the forms of academic entrepreneurship most directly linked to innovation-to-market processes. The findings suggest that while polytechnic researchers are engaged with industry, this engagement does not typically translate into formal technology transfer or venture creation, consistent with the "valley of death" challenge identified in the literature.



Research Question 2: What is researchers' research-commercialisation capability?

Table 2

Research-Commercialisation Capability of Respondents (N = 240)

Capability Dimension	Mean (SD)*	Interpretation
Opportunity recognition	2.82 (0.78)	Moderate
Intellectual property knowledge	2.24 (0.86)	Low-Moderate
Prototype development	2.68 (0.82)	Moderate
Business planning	2.42 (0.84)	Low-Moderate
Funding access	2.36 (0.88)	Low-Moderate
Market linkage	2.58 (0.80)	Moderate
Access to commercialisation support	2.38 (0.86)	Low-Moderate
Overall commercialisation capability	2.68 (0.74)	Moderate

Note. Scale: 1 = Very low, 4 = Very high.

Table 2 presents the research-commercialisation capability of respondents. The overall commercialisation capability score was 2.68 (SD = 0.74) on a 4-point scale, indicating moderate capability. The highest-scoring dimension was opportunity recognition (2.82), followed by prototype development (2.68) and market linkage (2.58). The lowest-scoring dimensions were intellectual property knowledge (2.24) and funding access (2.36), indicating significant gaps in these critical areas. Access to commercialisation support (2.38) and business planning (2.42) also scored below the midpoint, indicating limited capability in these areas. These findings are consistent with the literature on research commercialisation in Nigerian institutions, which has documented gaps in intellectual property knowledge and access to funding and support mechanisms. The low scores for intellectual property knowledge (2.24) are particularly concerning, as effective intellectual property protection is a prerequisite for many forms of commercialisation, including licensing and spin-off creation. The findings suggest that while researchers may have reasonable skills in identifying commercial opportunities and developing prototypes, they lack the knowledge and support required to protect, fund, and bring their innovations to market. This pattern of capability gaps is consistent with the literature on commercialisation capability in developing country contexts, where systemic weaknesses in technology transfer infrastructure constrain commercialisation outcomes.

Research Question 3: What is the innovation-to-market readiness of researchers' work?

Table 3

Innovation-to-Market Readiness (N = 240)

Readiness Dimension	Mean (SD)*	Interpretation
Technical readiness	2.72 (0.80)	Moderate
Market readiness	2.86 (0.76)	Moderate
Protection readiness	2.52 (0.84)	Moderate
Overall innovation-to-market readiness	2.74 (0.72)	Moderate

Note. Scale: 1 = Very low, 4 = Very high.

Table 4
Readiness by Innovation Type (N = 240)

Innovation Type	Frequency	Mean Readiness (SD)
Process innovation	92	2.82 (0.70)
Product innovation	86	2.74 (0.74)
Service innovation	62	2.64 (0.78)

Table 3 presents the innovation-to-market readiness of respondents. The overall readiness score was 2.74 (SD = 0.72), indicating moderate readiness. Market readiness scored highest (2.86), followed by technical readiness (2.72) and protection readiness (2.52). The lower score for protection readiness indicates that innovations are less prepared in terms of intellectual property protection, consistent with the low intellectual property knowledge identified in the capability assessment. Table 4 presents readiness by innovation type. Process innovations had the highest readiness (2.82), followed by product innovations (2.74) and service innovations (2.64). The moderate readiness scores indicate that while innovations have some level of technical and market readiness, there are significant gaps, particularly in protection readiness, that need to be addressed before commercialisation. These findings are consistent with the literature on technology readiness and commercialisation, which has documented that innovations often require significant further development and support before they are ready for market. The finding that protection readiness is the lowest dimension is particularly significant, as it suggests that innovations may be vulnerable to appropriation and that researchers may not be capturing the full value of their work.

Research Question 4: What are the drivers of and barriers to moving research innovations to market, and how are they ranked?

Table 5
Ranking of Barriers to Research Commercialisation (N = 240)

Barrier	Mean (SD)*	RII**	Rank
Inadequate funding for prototyping and market testing	3.52 (0.68)	0.88	1
Weak industry linkages	3.40 (0.72)	0.85	2
Limited commercialisation skills	3.28 (0.74)	0.82	3
Lack of institutional support	3.22 (0.78)	0.81	4
Inadequate intellectual property protection	3.16 (0.80)	0.79	5
Bureaucratic processes	3.08 (0.82)	0.77	6
Limited awareness of commercialisation pathways	3.00 (0.84)	0.75	7
Lack of recognition/incentives	2.92 (0.86)	0.73	8

Note. *Scale: 1 = Not a barrier, 4 = Major barrier. **RII = Relative Importance Index (mean/4.00).

Table 6
Ranking of Drivers of Research Commercialisation (N = 240)

Driver	Mean (SD)*	RII**	Rank
Industry demand for innovation	3.42 (0.70)	0.86	1
Institutional support and incentives	3.34 (0.72)	0.84	2
Access to funding for commercialisation	3.28 (0.74)	0.82	3

Driver	Mean (SD)*	RII**	Rank
Commercialisation training and skills development	3.20 (0.76)	0.80	4
Intellectual property support	3.14 (0.78)	0.79	5
Collaboration with industry partners	3.08 (0.80)	0.77	6
Recognition and reward systems	3.00 (0.82)	0.75	7

Note. *Scale: 1 = Not a driver, 4 = Major driver. **RII = Relative Importance Index (mean/4.00).

Table 5 presents the ranking of barriers to research commercialisation. The top-ranked barriers were inadequate funding for prototyping and market testing (RII = 0.88), weak industry linkages (RII = 0.85), and limited commercialisation skills (RII = 0.82). Lack of institutional support (RII = 0.81) and inadequate intellectual property protection (RII = 0.79) also ranked highly. The lowest-ranked barriers were lack of recognition/incentives (RII = 0.73) and limited awareness of commercialisation pathways (RII = 0.75). Table 6 presents the ranking of drivers of research commercialisation. The top-ranked drivers were industry demand for innovation (RII = 0.86), institutional support and incentives (RII = 0.84), and access to funding for commercialisation (RII = 0.82). Commercialisation training and skills development (RII = 0.80) and intellectual property support (RII = 0.79) also ranked highly. These findings are consistent with the literature on barriers to research commercialisation in developing countries, which has identified inadequate funding, weak industry linkages, and limited commercialisation skills as key constraints. The ranking of funding as the top barrier is consistent with the literature, which has documented that the lack of proof-of-concept and prototyping funding is a critical barrier in the "valley of death". The finding that weak industry linkages rank second is also consistent with studies on the Nigerian innovation system, which have documented weak linkages between academia and industry. The drivers identified align with the barriers, suggesting that interventions to address the barriers (increasing funding, strengthening industry linkages, building commercialisation skills) would also activate the drivers.

Research Question 5: What evidence-based recommendations can be generated to strengthen research commercialisation and innovation-to-market readiness?

Based on the findings of this study, several evidence-based recommendations were developed for strengthening research commercialisation and innovation-to-market readiness:

Short-term interventions (0–6 months): (1) Establish a technology transfer office or strengthen existing capacity in each polytechnic, with dedicated staff responsible for supporting researchers through the commercialisation process; (2) Develop and deliver commercialisation training programmes for researchers, focusing on intellectual property protection, business planning, and market assessment; (3) Create a proof-of-concept fund to support prototyping and market testing of promising innovations; (4) Organise industry engagement events to build linkages between researchers and potential industry partners; and (5) Develop a database of research expertise and innovations to facilitate industry access.

Medium-term interventions (6–24 months): (1) Establish formal industry partnership programmes with structured collaboration mechanisms; (2) Develop a comprehensive intellectual property policy and support system, including assistance with patenting and licensing; (3) Create incubator or accelerator facilities to support spin-off creation and venture development; (4) Introduce recognition and reward systems for researchers engaged in commercialisation, including consideration in promotion and tenure decisions; and (5) Build a network of mentors and role models who have successfully commercialised their research.

Long-term approaches (2–5 years): (1) Develop a national framework for research commercialisation in polytechnics, with clear policies, incentives, and support mechanisms; (2) Establish a dedicated funding stream for research commercialisation, including proof-of-concept, prototyping, and market testing grants; (3) Strengthen linkages between polytechnics and industry through joint research centres, collaborative programmes, and industry advisory boards; (4) Develop a national innovation ecosystem that connects polytechnics, universities, research institutes, industry,



and government; and (5) Advocate for policy reforms that support academic entrepreneurship, including flexible intellectual property regimes and incentives for industry-academia collaboration.

Discussion

The central finding of this study is the demonstration that academic entrepreneurship engagement, research commercialisation capability and innovation-to-market readiness are moderately developed among polytechnic researchers in South-West Nigeria, with significant gaps in intellectual property knowledge, funding access, and protection readiness. The overall academic entrepreneurship engagement score of 2.86 (SD = 0.72) indicates that researchers are engaged with industry through relational mechanisms such as consultancy (52.4%) and collaborative research (48.2%), but less through formal technology transfer mechanisms such as patenting (18.3%) and spin-off creation (8.6%). These findings are consistent with the literature on academic entrepreneurship in Nigerian institutions, which has documented moderate levels of engagement with a predominance of consultancy and collaborative research over patenting and spin-offs. The low levels of patenting and spin-off creation are particularly significant, as these are the forms of academic entrepreneurship most directly linked to innovation-to-market processes. The finding that industry interaction (3.02) scored higher than commercialisation activity (2.74) suggests that researchers interact with industry more through relational mechanisms than through formal commercialisation channels, consistent with the "valley of death" challenge identified in the literature.

The research-commercialisation capability assessment revealed a moderate overall score (2.68) with significant gaps in intellectual property knowledge (2.24) and access to commercialisation support (2.38). These findings are consistent with the literature on research commercialisation in Nigerian institutions, which has documented gaps in intellectual property knowledge and access to funding and support mechanisms. The low scores for intellectual property knowledge are particularly concerning, as effective intellectual property protection is a prerequisite for many forms of commercialisation, including licensing and spin-off creation. The finding that access to commercialisation support is low (2.38) suggests that institutions lack the technology transfer infrastructure required to support researchers through the commercialisation process. The pattern of capability gaps is consistent with the literature on commercialisation capability in developing country contexts, where systemic weaknesses in technology transfer infrastructure constrain commercialisation outcomes. The innovation-to-market readiness assessment revealed moderate readiness (2.74), with protection readiness (2.52) being the lowest dimension, consistent with the low intellectual property knowledge identified in the capability assessment. The finding that process innovations had the highest readiness (2.82) suggests that process innovations may be more easily commercialised than product or service innovations, possibly because they require less formal protection and can be implemented through consultancy or collaborative arrangements.

The barrier ranking analysis identified inadequate funding for prototyping and market testing as the top barrier (RII = 0.88), followed by weak industry linkages (RII = 0.85) and limited commercialisation skills (RII = 0.82). These findings are consistent with the literature on barriers to research commercialisation in developing countries, which has identified inadequate funding, weak industry linkages, and limited commercialisation skills as key constraints. The finding that weak industry linkages rank second is consistent with studies on the Nigerian innovation system, which have documented weak linkages between academia and industry. The driver ranking analysis identified industry demand for innovation (RII = 0.86), institutional support and incentives (RII = 0.84), and access to funding for commercialisation (RII = 0.82) as the top drivers. The alignment between barriers and drivers suggests that interventions to address the barriers (increasing funding, strengthening industry linkages, building commercialisation skills) would also activate the drivers. The structural equation modelling results showed that research commercialisation capability partially mediates the relationship between academic entrepreneurship engagement and innovation-to-market readiness (indirect effect = 0.18, $p < 0.01$), indicating that engagement alone is not sufficient; capability is required to translate engagement into readiness. This finding is consistent with the literature on the determinants of commercialisation, which has identified capability as a decisive variable. Overall, the findings confirm that while polytechnic researchers in South-West Nigeria are engaged with industry, their commercialisation capability and innovation-to-market readiness are constrained by significant gaps in intellectual property knowledge, funding access, and support



mechanisms, and they provide evidence-based recommendations for strengthening research commercialisation in Nigerian polytechnics.

Conclusion

This study examined academic entrepreneurship, research commercialisation capability and innovation-to-market readiness among researchers in polytechnics in South-West Nigeria. The findings revealed moderate levels of academic entrepreneurship engagement (mean = 2.86), with consultancy (52.4%) and collaborative research (48.2%) being most common, and patenting (18.3%) and spin-off creation (8.6%) being least common. Research commercialisation capability was moderate (mean = 2.68), with significant gaps in intellectual property knowledge (2.24) and access to commercialisation support (2.38). Innovation-to-market readiness was moderate (mean = 2.74), with protection readiness scoring lowest (2.52). The top-ranked barriers were inadequate funding (RII = 0.88), weak industry linkages (RII = 0.85), and limited commercialisation skills (RII = 0.82). The study provides evidence-based recommendations for strengthening research commercialisation in Nigerian polytechnics. The principal implication is that while polytechnic researchers are engaged with industry, their commercialisation capability and innovation-to-market readiness are constrained by significant gaps in intellectual property knowledge, funding access, and support mechanisms, and that interventions to address these gaps would significantly enhance the commercialisation of polytechnic research. Future research should extend this work in several directions: longitudinal studies to track changes in commercialisation capability and readiness over time; comparative studies across different institutional types and regions; intervention studies to evaluate the effectiveness of commercialisation support programmes; and qualitative research to explore the lived experiences of researchers navigating the commercialisation process.

Funding

This research was funded through the Tertiary Education Trust Fund (TETFund) Institution-Based Research (IBR) Intervention, The Federal Polytechnic Ede, Osun State, Nigeria. The funding agency provided financial support for the execution of the study. The funder had no role in the study design; data collection, analysis, or interpretation; manuscript preparation; or the decision to publish the findings.

Conflict of Interest

The authors declare that there are no competing financial interests or personal relationships that could have influenced the work reported in this study.

References

- Adeyeye, A. D., & Oluwatope, O. B. (2023). Bridging the valley of death in Nigerian research commercialisation: The role of proof-of-concept funding. *African Journal of Science, Technology, Innovation and Development*, 15(4), 512–524. <https://doi.org/10.1080/20421338.2022.2163716>
- Doanh, D. C., Bernat, T., Hieu, N. T., Ngoc, N. B., & Linh, N. T. P. (2021). Academic entrepreneurship: An empirical research of invention commercialisation. *Central European Business Review*, 10(4), 25–45. <https://doi.org/10.18267/j.cebr.267>
- Dwivedi, A. K., & Tiwari, M. (2021). Entrepreneurial competencies of undergraduate students: The case of universities in Nigeria. *The International Journal of Management Education*, 19(3), Article 100452. <https://doi.org/10.1016/j.ijme.2020.100452>
- Ilori, M. O., & Ogunjemilua, O. O. (2024). Innovation system and research commercialisation in Nigerian polytechnics: An assessment of institutional capacity. *Journal of Innovation Management*, 12(1), 45–68.
- Marjanovic, U., Leoste, J., & Peña, L. (2026). Operationalizing academic entrepreneurship: An organizational-level model of knowledge transfer in universities. *Industry and Higher Education*. <https://doi.org/10.1177/14657503261438625>
- Nwagwu, W. E., & Egbon, O. (2024). Technology transfer and commercialisation of research in Nigerian universities: Barriers and enablers. *Journal of Technology Transfer*, 49(2), 456–478. <https://doi.org/10.1007/s10961-023-10012-3>



- Nwibe, K. J., & Ogbuanya, T. C. (2024). Emotional intelligence and entrepreneurial intention among university undergraduates in Nigeria: Exploring the mediating roles of self-efficacy domains. *Journal of Innovation and Entrepreneurship*, 13(1), 1–22. <https://doi.org/10.1186/s13731-024-00367-7>
- Ojo, O. O., & Adeyemo, S. A. (2025). Intellectual property awareness and technology transfer practices in Nigerian tertiary institutions. *World Patent Information*, 76, 102186. <https://doi.org/10.1016/j.wpi.2024.102186>
- Otache, I., Edopkolor, J. E., & Kadiri, U. (2022). A serial mediation model of the relationship between entrepreneurial education, orientation, motivation and intentions. *The International Journal of Management Education*, 20(2), Article 100645. <https://doi.org/10.1016/j.ijme.2022.100645>
- Ozdemir, S., & Sharma, S. (2024). Academic entrepreneurship: A systematic review and future research agenda. *Technological Forecasting and Social Change*, 198, 122987. <https://doi.org/10.1016/j.techfore.2023.122987>