

Research Article

Nurturing entrepreneurial creativity by educational managers and science teachers in university in Kwara State Nigeria

O. R. Sa'adu^{a*} & A. A. Tijani^b

^a Department of Science Education, Al-Hikmah University, Ilorin, Nigeria.

^b Department of Educational Management, Faculty of Education, University of Ilorin, Nigeria.

Abstract

This study investigates how educational managers and science teachers in universities across Kwara State, Nigeria, promote entrepreneurial creativity among students. Recognizing the value of innovation, critical thinking, and self-reliance in science education, the research explores the strategies adopted by educators, assesses their effectiveness, and identifies challenges encountered during implementation. A structured questionnaire was used to collect data from 500 people in a descriptive survey design. Findings reveal that both educational managers and science teachers employ various approaches such as project-based learning, mentorship, problem-solving curricula, and collaboration with industry partners, all with mean ratings exceeding the adoption benchmark. These methods have significantly enhanced students' creativity, innovation, practical skills, and self-reliance. Nonetheless, issues like poor infrastructure, inadequate teacher training, and weak policy support hinder the full integration of entrepreneurship into science education. Educational managers mostly care about project-based learning, but science teachers care more about problem-solving and skill-building. Despite these differences, both groups concur that fostering entrepreneurial creativity positively influences students' learning outcomes. The study emphasizes the importance of continuous professional development, stronger institutional backing, and effective policy initiatives to better embed entrepreneurship in science teaching. Such measures are essential to prepare students with the competencies needed to succeed in an innovation-driven economy and to contribute meaningfully to Nigeria's socio-economic progress. Overall, the research underscores the crucial role of educational leaders and teachers in creating dynamic learning environments that inspire entrepreneurship and equip students for future career challenges.

Keywords: Entrepreneurial Creativity, Educational Managers, Science Teachers, University Education and Kwara State, Nigeria

1. Introduction

Educational managers and science teachers play a pivotal role in nurturing entrepreneurial creativity in university students. As key stakeholders in the educational process, they are strategically positioned to shape the learning environment, curriculum, and instructional methods that foster innovation and self-reliance. Their leadership and instructional practices

directly influence how students perceive entrepreneurship and develop related skills. According to Oni and Ngongpah (2025), these educators serve not only as facilitators of knowledge but also as mentors who guide students in exploring creative ideas, taking initiative, and solving real-world problems through science-based approaches.

By creating an enabling environment that promotes experimentation and risk-taking, educational managers and science teachers can empower students to move beyond rote learning toward innovative thinking. Classrooms that encourage open dialogue, idea-sharing, and project-based learning give students the confidence to test ideas, learn from failure, and refine their solutions skills essential to entrepreneurship. In this context, teachers who act as facilitators rather than mere content deliverers help cultivate a growth mindset in students.

The learning atmosphere should support curiosity, constructive feedback, and resilience, which are all necessary attributes for entrepreneurial success (Priyaa et al, .2025).

*Corresponding author: O. R. Sa'adu

Email: rasheedatsaadu834@gmail.com (O. R. Sa'adu)

ORCID: <https://orcid.org/0009-0003-3316-4677>

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Furthermore, the use of effective teaching strategies such as problem-solving tasks, interdisciplinary collaboration, and mentorship programs plays a significant role in building students' critical thinking, creativity, and collaboration skills. These strategies help bridge the gap between theoretical science and practical application, encouraging students to see themselves as innovators and problem-solvers. Garg, (2025) emphasize, when educational leaders and teachers are intentional about integrating entrepreneurship into science education, they help students build the competencies needed to thrive in a competitive, innovation-driven world.

Despite the growing need for entrepreneurial creativity among Nigerian youth, science classrooms in secondary schools often lack structured strategies to foster innovation and problem-solving (Laid & Adlaon,2025). Educational managers and science teachers frequently face challenges in integrating entrepreneurial elements into the science curriculum due to limited training, resources, and institutional support. There is a noticeable gap in practical, context-specific strategies that guide educators in cultivating students critical thinking, experimentation, and risk-taking abilities within science learning environments. (Magasi, 2025) Therefore, this study seeks to identify and promote effective strategies that educational managers and science teachers can adopt to nurture entrepreneurial creativity among secondary school students in Nigeria. This study is significant as it offers insights into effective strategies that educational managers and science teachers can use to foster entrepreneurial creativity in Nigerian secondary schools. Its findings will help improve science teaching, inform educational policies, and support the development of innovative, self-reliant students. Therefore, the objectives of this study are:

- (i) identify effective strategies that educational managers and science teachers can use to promote entrepreneurial creativity in science classrooms.
- (ii) assess the current practices of educational managers and science teachers in nurturing entrepreneurial creativity in science classrooms.
- (iii) determine the challenges that educational managers and science teachers face in nurturing entrepreneurial creativity in science classrooms.
- (iv) inform policy and practice in science education by providing recommendations on how to nurture entrepreneurial creativity in science classrooms.
- (v) enhance student outcomes by promoting entrepreneurial creativity and innovation in science education.

The following research questions were used:

1. What strategies do educational managers and science teachers use to nurture entrepreneurial creativity in science classrooms?
2. What are the perceptions of educational managers and

science teachers on the importance of nurturing entrepreneurial creativity in science classrooms?

3. Are there significant differences in the perceptions of educational managers and science teachers on the strategies for nurturing entrepreneurial creativity in science classrooms?

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

- H₀₁ There is no significant difference in the perceptions of educational managers and science teachers on the importance of nurturing entrepreneurial creativity in science classrooms.
- H₀₂ There is no significant difference in the strategies used by educational managers and science teachers to nurture entrepreneurial creativity in science classrooms.

2. Literature Review

Nurturing entrepreneurial creativity within university science classrooms is crucial for promoting innovation, problem-solving, and self-reliance among students. As universities in Kwara State, Nigeria, strive to produce graduates equipped for a dynamic economy, there is a growing need for science education to move beyond theoretical instruction and encourage practical creativity. According to Ningsih et al. (2024), science teachers should adopt student-centered teaching approaches that promote collaboration, freedom to innovate, and idea sharing, thereby enabling students to develop critical and entrepreneurial thinking skills. Such approaches allow learners to connect classroom knowledge with real-world applications and inspire confidence in initiating innovative projects.

Various strategies have been identified as effective in nurturing entrepreneurial skills among science students. Adejoke (2025) emphasizes methods such as project-based learning, mentorship, experiential learning, and guest lectures, which expose students to authentic experiences that stimulate creativity and innovation. These strategies empower students to apply scientific knowledge in developing solutions to societal challenges. However, their success largely depends on the capacity of educators and the support they receive. As Yusuf (2025) notes, educational managers play a vital role by providing adequate training, teaching resources, and institutional support that enable science teachers to integrate entrepreneurship education effectively. Collaboration among teachers, industry experts, and entrepreneurs further enhances this process by fostering innovative thinking and real-life problem-solving skills within the science classroom. Creative thinking plays a crucial role in enhancing students' entrepreneurial abilities. The Capability Approach highlights the need to give learners the freedom and opportunities to cultivate their entrepreneurial skills by creating a supportive learning environment and designing a curriculum that promotes innovation and creative problem-solving(Adeoye et al.,2024).According to Saygin et al.,2024 Educational

management is essential for promoting entrepreneurship education by setting clear goals, designing effective curricula, and providing necessary resources and infrastructure to build a supportive learning environment. Incorporating creative strategies like divergent thinking and discovery learning helps students develop innovative problem-solving skills and adaptability in the global workforce. Entrepreneurial training through action learning, internships, and mini-company projects further strengthens this approach, especially when supported by curriculum review and collaboration with private investors. Teachers also play a key role, as those with entrepreneurial mindsets can better nurture creativity and innovation in students. Although challenges such as limited funding, inadequate teacher training, and resistance to curriculum change exist, addressing them is crucial for building a resilient education system that fosters entrepreneurial creativity.

Nurturing entrepreneurial creativity requires collaboration between educational managers and science teachers to promote an entrepreneurial mindset that fosters creativity and innovation. Integrating entrepreneurial concepts into science education helps students develop innovative solutions to real-world problems, while project-based learning and design thinking enhance creativity and a culture of entrepreneurship. Educational managers can support this by providing resources, mentorship, and networking opportunities, while experiential learning methods like internships and hackathons equip students with practical skills and confidence for entrepreneurial success. (DeCoito & Briona, 2023)

Equally important is the curriculum, which should be designed to integrate entrepreneurial concepts and skills relevant to modern socio-economic realities. Wahab and Akintade (2025) argue that curriculum development should prioritize the inclusion of topics that promote creativity, innovation, and self-reliance. Nevertheless, the integration of entrepreneurship education into science teaching continues to face systemic challenges. As Dania (2025) observes, factors such as inadequate infrastructure, insufficient teaching materials, poorly trained educators, and the absence of practical learning environments significantly undermine the success of entrepreneurship education in Nigeria. These challenges limit both the effectiveness of instruction and students' ability to transform entrepreneurial ideas into practical outcomes. Addressing these barriers requires deliberate action from government and educational institutions. Ahmadu et al. (2025) advocate for greater investment in educational infrastructure, the establishment of well-equipped entrepreneurship laboratories, and comprehensive teacher training programs. Furthermore, regular monitoring and evaluation of entrepreneurship initiatives are necessary to ensure responsiveness to current economic conditions. Ultimately, the effective implementation of strategic efforts by educational managers and science teachers is essential for nurturing entrepreneurial

creativity among university students. As Jenkins (2025) highlights, creating supportive learning environments that encourage innovation, critical thinking, and self-reliance empowers students to become proactive problem-solvers and contributors to Nigeria's technological advancement, economic growth, and sustainable development.

3. Methodology

This study adopted a descriptive survey research design to investigate how educational managers and science teachers in universities in Kwara State, Nigeria, nurture entrepreneurial creativity among students. The design was considered suitable because it allows for the collection of detailed information on existing practices, perceptions, and strategies without manipulating any variables. The population of the study comprised all educational managers and science teachers in both public and private universities across Kwara State. From this population, a total of 500 respondents were selected using a stratified random sampling technique to ensure adequate representation across institutions and staff categories. A self-developed instrument titled Nurturing Entrepreneurial

Creativity in Science Classrooms Questionnaire (NECSCQ) was employed for data collection. The questionnaire was structured into sections that obtained information on demographic characteristics, strategies adopted by educators, and challenges encountered in fostering entrepreneurial creativity. It also contained items designed to assess the perceived effectiveness of various teaching methods and administrative initiatives related to entrepreneurship education. The instrument was validated by experts in science education and educational management to ensure content validity, while its reliability was established through a pilot test using the Cronbach Alpha statistic, giving a coefficient index of 0.80 (80%).

The questionnaire was administered through both online and face-to-face methods to enhance participation and ensure comprehensive data collection. Data gathered were analyzed using descriptive statistics such as mean and standard deviation to answer the research questions, while inferential statistics including the independent t-test and Analysis of Variance (ANOVA) were used to test the formulated hypotheses at a 0.05 level of significance. These analyses were employed to determine whether significant differences existed between educational managers and science teachers in their perceptions and practices regarding the promotion of entrepreneurial creativity in science education. The study aimed to identify effective strategies adopted by university educational managers and science teachers in promoting entrepreneurial creativity as well as the challenges hindering its implementation.

4. Results

In this section results of the analysed data for research questions and hypotheses are presented.

4.1 Answers Research Questions and Test of Hypotheses

Table 1. Mean rating of different strategies used educational managers and science teachers to nature entrepreneurship creativity in universities in Kwara state.

S/N	Strategies Adopted	Educational Managers	Science Teachers
1	Project based learning	5.20	3.00
2	Mentorship	3.30	3.15
3	Entrepreneurship	3.05	3.25
4	Guest lectures	2.08	3.35
5	Collaborate with industrial expert	3.10	3.20
6	Problem solving curriculum	3.10	5.15
7	Incorporate relevant skills	2.90	3.30
8	Student skills training	2.85	3.40
9	Student Industrial Work	3.00	3.20
10	Attached Students to entrepreneurs Centre		
	Grand mean	2.99	3.21

2.99

4.1.1. Answers to Research Questions

Research Question 1: *What strategy was majorly adopted by educational managers and science teachers to nature entrepreneurship creativity?*

In Table 1 the benchmark for Grand mean greater than 2.49 is majorly adopted, less than 2.50 is Rarely adopted Table 1 shows the frequency of adoption of entrepreneurial activities by both Educational Managers and Science Teachers universities in Kwara State. It revealed that both Educational Managers and Science Teachers grand mean of

and 3.21 respectively. Since all the grand mean are more than the bench mark score; it indicates all strategies were adopted by Educational Manger and science Teachers in Universities in Kwara State.

Research Question 2: *What is the impact of entrepreneurship creativity on student as assessed by Educational Managers and Science Teachers in Universities in Kwara State?*

Table 2. Mean rating of the assessment of impact of entrepreneurship creativity on students in Universities in Kwara State.

S/N	Assessment of the impact of entrepreneurship	Educational Manager	Science Education
1	Cultivate student critical thinking	2.65	3.25
2	Enhance skill acquisition	2.85	2.60
3	Expose student to new creativity	3.10	2.75
4	Create job opportunities and employment	2.70	3.00
5	It develops innovation of ideals	2.56	2.65
6	It enhances diversity of knowledge	2.62	2.70
7	Enhance ability to self-reliance	3.10	3.00

Benchmark: 2.50

Table 2 indicate the impact of entrepreneurship creativity as assessed by both educational Managers and Science Teachers in Universities in Kwara State have mean scores

greater than 2.50 bench mark. The result hence revealed that entrepreneurship creativity (Skills) has impacted on the variables identified.

Table 3. t-test analysis of the assignment of strategists adopted by both educational managers and science Teachers

Variables	N	Mean	SD	Std Error	DF	t	P	Decision
Educational Manager	200	68.74	25.59	5.49	3.00	81.56	0.00	Sig. (H ₀₁ rejected)
Sciences Teachers	300	27.39	11.04					

4.1.2. Test of Research Hypotheses

Hypothesis 1: *There is no significant difference in the assignment of educational managers and science teachers on the strategists for nurturing entrepreneurship creativity in university in Kwara states.*

Results in Table3 showed that the p-value of 0.00 which is significant, since it is less than 0.05. This indicate that the null- hypothesis which state that “there is no significant

difference in the assessment of strategies adopted by both Educational Manager and Science Teachers in universities in Kwara state” is therefore rejected.

Hypothesis 2: *There is no significant difference between the perception of Educational Manager and Science Teacher on the impact of entrepreneurial creativity in universities in Kwara state.*

Table 4. t-test analysis of the impact of entrepreneurial creativity adopted by both educational managers and science Teachers

Variables	N	Mean	SD	Std Error	DF	t	p	Decision
Educational Manager	300	56.83	23.64	4.71				
Sciences Teachers	200	29.00	20.72	1.42	3.00	36.71	0.002	Sig. (H ₀₂ Rejected)

The result in Table 4 indicates that P-value of 0.02 less than the critical value of 0.05 and t-value of 36.71 which showed that null-hypothesis was rejected since there exist a statistical significance in the compared means. Hence there was significant difference on the mean responses of both Educational Managers and Science Teachers on the impact of nurturing entrepreneurial creativity in universities in Kwara state.

5. Discussion

The findings of this study highlight the importance of nurturing entrepreneurial creativity in science classrooms as a means of fostering innovation, self-reliance, and future economic empowerment among students. The results revealed that both educational managers and science teachers in universities in Kwara State generally adopted a range of strategies to support entrepreneurial learning, with all strategies having mean ratings above the benchmark of 2.50. Educational managers showed a strong preference for project-based learning, while science teachers prioritized problem-solving curricula, student skill training, and guest lectures. These findings align with the literature (Ningsih et al., 2024; Saygin et al.,2024 , Adejoke, 2025), which emphasizes student-centered learning, mentorship, and experiential teaching as effective methods for developing entrepreneurial skills. Additionally, the study found that entrepreneurial creativity had a positive impact on students

by enhancing critical thinking, creativity, innovation, and job readiness, supporting prior research by Wahab & Akintade (2025) and Yusuf (2025). However, systemic challenges such as inadequate infrastructure, limited teaching materials, and insufficient teacher training as noted by Dania (2025) remain significant barriers to the effective integration of entrepreneurship education in science classrooms. The study's hypotheses further revealed statistically significant differences between educational managers and science teachers in their assessments of strategies used, but not in their perceptions of the impact on students, suggesting a shared recognition of entrepreneurship's value despite varied implementation approaches. Overall, the findings underscore the need for targeted investments, collaborative partnerships, continuous teacher development, and policy support to create enabling environments that promote entrepreneurial creativity and prepare students to become proactive problem-solvers and contributors to national development (Adeoye et al.,2024, Jenkins, 2025).

The study examined the strategies adopted by educational managers and science teachers to nurture entrepreneurial creativity in universities in Kwara State, as well as the perceived impact of these strategies on students. The findings revealed that all the assessed strategies had mean ratings above the benchmark of 2.50, indicating that they were generally adopted by both groups. Educational managers prioritized project-based learning, while science

*Corresponding author: O. R. Sa'adu

Email: rasheedatsaadu834@gmail.com (O. R. Sa'adu)

ORCID: <https://orcid.org/0009-0003-3316-4677>

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teachers focused more on problem-solving curriculum, student skills training, and guest lectures. The assessment of the impact of entrepreneurial creativity showed positive outcomes, including the cultivation of critical thinking, enhancement of skill acquisition, exposure to new ideas, job creation, innovation, knowledge diversity, and self-reliance. Hypothesis testing showed significant differences in the assessments of strategies and perceptions of impact between educational managers and science teachers, suggesting that while both groups are committed to promoting entrepreneurship, their approaches and perceptions differ.

6. Conclusion

The study concludes that both educational managers and science teachers in Kwara State universities adopt various strategies to promote entrepreneurial creativity, with positive impacts on students' skills, innovation, and self-reliance. While all strategies were generally adopted, differences in emphasis and perception between the two groups suggest a need for greater collaboration. Overall, nurturing entrepreneurial creativity is vital for preparing students for future economic and career challenges.

Recommendations:

The following recommendations are proffered based on the major findings of the study Nurturing Entrepreneurial creativity by educational managers and Science Teachers in university in Kwara State Nigeria

- Educational managers and science teachers should consistently implement effective strategies such as project-based learning, problem-solving curriculum, student skills training, and mentorship to promote entrepreneurial creativity in science classrooms. These methods have been shown to enhance critical thinking, innovation, and self-reliance among students.
- Regular training and workshops should be organized for educational managers and science teachers to enhance their capacity and update them on current best practices for nurturing entrepreneurial creativity in science education.
- Institutions should identify and address key challenges such as lack of resources, limited collaboration with industry, and insufficient policy support that hinder the effective integration of entrepreneurship in science education.
- Policymakers and school authorities should create and enforce educational policies that prioritize entrepreneurship in science curricula. This includes allocating adequate resources, fostering school-industry partnerships, and embedding entrepreneurship objectives in lesson plans.
- Teaching approaches should prioritize active learning, innovation, and practical experiences that promote entrepreneurial thinking among students.

Emphasis should be placed on real-world applications, creative problem-solving, and student participation in innovation-driven projects.

Abbreviations

NECSCQ Nurturing Entrepreneurial Creativity in Science Classrooms Questionnaire

Author Contributions

O. R. Sa'adu: Conceptualization, Methodology, Writing-original draft,

A. A. Tijani: Methodology, Analysis of result, Writing-Review and Editing

Conflicts of Interest

The author(s) declare that they have no known competing financial interests, professional affiliations or personal relationships that could have appeared to influence the work reported in this paper,

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