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The Development of Start-Up Applications for Skills Training Under the Technological Entrepreneurship Development Center (TEDC) in the Polytechnics

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Abstract **Original Research Article**

The swift advancement of digital technologies has reformed how entrepreneurship education and skills development are delivered. Polytechnics, as one of the centers of technical learning in Nigeria, must adopt innovative strategies to foster entrepreneurial competencies among students. This study focuses on the development of start-up applications for skills training under the Technological Entrepreneurship Development Center (TEDC) in the polytechnics. The project aims to design and implement a digital platform that integrates experiential learning, mentorship, and business incubation resources to support students in acquiring technical, managerial, and entrepreneurial skills. The methodology used was a hybrid approach that combined the Structured Systems Analysis and Design Methodology (SSADM) for building the application and the Analysis, Design, Development, Implementation, Evaluation (ADDIE) for the training content. The design structure makes the TEDC application a digital incubator that blends technology (SSADM) and education (ADDIE) to provide Polytechnics with a powerful tool for skills training and entrepreneurship development. SSADM focuses on the technical system development of an application, while ADDIE focuses on the educational design of the content that the application will deliver. The development process involves a detailed needs assessment through surveys and interviews with stakeholders such as the facilitators, students and management, followed by the design and prototyping of the application. Pilot testing was conducted to gather feedback and refine the application before full deployment for various for skills training under the Technological Entrepreneurship Development Center (TEDC) in Polytechnics.

Keywords: start-up application, Digital platform, skills training, Technological Entrepreneurship Development Center.

1. Introduction

The dynamic nature of the global economy demands a new generation of graduates who are not only job seekers but also job creators. Polytechnics, being institutions focused on practical and technical skills, play a pivotal role in nurturing entrepreneurship. However, traditional teaching approaches are often insufficient to instill real-world entrepreneurial competencies. To address this gap, the Technological Entrepreneurship Development Center (TEDC) was established in

many polytechnics to promote innovation, incubation, and entrepreneurship. Yet, the effectiveness of TEDCs is often constrained by limited tools for skills training and business incubation. This paper explores the development of digital start-up applications as pedagogical tools to enhance entrepreneurship training within TEDC programs.

The establishment of the Technological Entrepreneurship Development Center (TEDC) within Polytechnics serves as a structured platform for fostering entrepreneurship, creativity, and innovation among students. Okoli and Nwosu (2019) argue that entrepreneurship centers in higher institutions act as "incubators for students' business ideas, providing mentorship, training, and access to resources that aid in transforming ideas into start-ups." This aligns with the broader mission of TEDC, which is to bridge the gap between technical education and enterprise creation Furthermore, the integration of digital applications into skills training resonates with the global shift toward digital learning and innovation ecosystems. UNESCO (2021) emphasizes that "digital platforms and entrepreneurship hubs in higher education have become critical in promoting innovation and addressing 21st-century skills gaps." Hence, the development of start-up applications under TEDC is not only a local institutional initiative but also a contribution to a global educational trend.

The development of start-up applications within TEDC is a strategic intervention that leverages technology to enhance skills training. Such applications can serve as interactive platforms for learning, collaboration, mentoring, and project incubation. As Ayoade and Agwu (2016) observe, *"*technology-based entrepreneurship training creates a dynamic environment where students can simulate real business experiences, experiment with innovation, and build sustainable start-ups**."**This implies that embedding technology into entrepreneurship education enhances its effectiveness.

Therefore, the nature of this study rests on the intersection of education, technology, and entrepreneurship development. It seeks to design and implement start-up applications that can empower Polytechnic students with the necessary skills, resources, and entrepreneurial mindset to create employment, foster innovation, and contribute to national economic growth.

1.1 Statement of the Problem

The project addresses the following key problems:

1. **Inadequate Use of Digital Tools:** Existing training methods at TEDCs rarely incorporate modern digital platforms and technologies that can enhance entrepreneurial learning.
2. **Low Student Participation in Start-ups:** Due to insufficient exposure and support, many students show little interest or confidence in initiating start-up projects.
3. **Absence of a Centralized Digital Platform:** There is no unified system within TEDCs to provide continuous skills training, mentorship, collaboration, and business development support.
4. **Fragmented Support for Entrepreneurship Development:** Existing entrepreneurship initiatives are isolated and lack coordination, reducing their effectiveness and sustainability.

1.2 **Aim and objective of the Study**

The aim of this study is to develop start-up applications that will enhance skills training and promote entrepreneurship among students under the Technological Entrepreneurship Development Center (TEDC) in the polytechnics.

Objectives of the Study

The specific objectives of the study are to:

1. Assess the current state of skills training and entrepreneurial development programs under the TEDC in the polytechnics.
2. Identify the needs and challenges faced by students in accessing practical

entrepreneurial training and support services.
3. Design and develop start-up applications that integrate interactive learning modules, mentorship networks, and business development tools.
4. Implement and test the developed applications to evaluate their functionality, usability, and effectiveness in supporting skills training.
5. Promote collaboration and innovation among students through a centralized digital platform under the TEDC.
6. Evaluate the impact of the start-up applications on students' entrepreneurial competencies and readiness for the labor market.

2. Literature Review

2.1 Conceptual Framework

This study is anchored on the idea that digital start-up applications can enhance skills training and entrepreneurial development under the TEDC framework in polytechnics. The conceptual framework links the inputs (resources and activities), processes (development and implementation of the application), and outputs/outcomes (improved skills and start-up creation) to show how the project will achieve its objectives.

2.2 Entrepreneurship Education and Skills Training

Entrepreneurship education has become central to addressing unemployment and promoting innovation in developing economies. Drucker *(1985)* argued that"entrepreneurship is not a science or an art; it is a practice," underscoring the importance of practical training in entrepreneurship. Similarly, Adebayo and Ojo (2019) observed that Nigerian higher institutions have adopted entrepreneurship education as a compulsory course to promote job creation and self-reliance among graduates.

Fayolle and Gailly (2015) emphasized that effective entrepreneurship education must integrate pedagogical innovation and experiential learning, rather than traditional lecture-based approaches. This indicates that platforms such as applications and digital tools can serve as enablers of practical entrepreneurial experiences.

The integration of digital technologies into entrepreneurship training has been shown to enhance students' engagement and learning outcomes. Eze and Okoye (2022) found that digital learning applications foster creativity, collaboration, and innovation by enabling students to simulate business processes, access mentorship networks, and build business models in virtual environments. In the same vein, Nwosu and Umeh (2021) emphasized that start-up applications can serve as centralized platforms for entrepreneurial training, offering interactive modules, business planning tools, and peer collaboration features that are lacking in traditional training approaches

Entrepreneurship education has evolved from classroom-based lectures to experiential and technology-enhanced learning. Scholars have emphasized that digital technologies can support entrepreneurial skill acquisition by enabling simulation, collaboration, and real-time feedback.

2.3 Polytechnics and the Role of TEDC

Polytechnics were established to provide technical and vocational education, equipping students with practical and entrepreneurial skills. Okoli and Nwosu (2019) argued that entrepreneurship centers in Polytechnics act as incubators for student business ideas, offering mentorship and resources for business creation.

The Technological Entrepreneurship Development Center (TEDC) provides an institutional framework within Polytechnics to bridge the gap between classroom knowledge and entrepreneurial practice. According to Adepoju and Olaleye (2020), entrepreneurship development centers in higher institutions play a crucial role in incubating start-

ups, offering business support services, and nurturing innovative thinking among learners.

2.4 Digital Start-up Applications

Start-up applications are digital platforms that guide users through entrepreneurial processes, including ideation, business modeling, market analysis, financial planning, and prototype development. Their integration into educational settings has been shown to improve learner engagement and innovation capabilities.

In the context of entrepreneurship education, a digital platform refers to an online tool or application that provides students with access to entrepreneurial training resources, mentorship, incubation services, and business networking opportunities. It serves as a virtual environment where participants can interact, collaborate, and carry out activities such as learning, trading, networking, or innovation. According to Van Alstyne, Parker, &Choudary (2016), "a digital platform is a business model that creates value by facilitating exchanges between two or more interdependent groups, usually consumers and producers, using digital technology." UNESCO (2021) defines digital platforms as "online systems and tools that enable learning, collaboration, and innovation by connecting people, content, and services in an interactive way."

Digital technology has reshaped how entrepreneurship is taught and practiced. Van Alstyne, Parker, and Choudary (2016) defined digital platforms as "networked infrastructures that create value by enabling interactions between different groups." In an educational context, UNESCO (2021) highlighted that digital platforms can expand access to skills development opportunities while offering interactive features like simulations and virtual collaboration.

Kolb's (1984) theory of experiential learning suggests that digital platforms enable hands-on practice, reflection, and application in entrepreneurship training. Ayoade and Agwu (2016) further reported that technology-based entrepreneurship training in Nigeria fosters creativity, innovation, and start-up development among students.

2.5 **Knowledge Gap**

Although Technological Entrepreneurship Development Centers (TEDCs) have been established in many polytechnics to foster innovation and entrepreneurial skills, there is still a significant gap between the training provided and the real-world requirements of launching start-up application.

3. Methodology

3.1 Research Design

The design structure integrates two complementary methodologies the Structured Systems Analysis and Design Methodology (SSADM) for building the application itself.SSADM guides the technical development of the application and the Analysis, Design, Development, Implementation, Evaluation (ADDIE) for the training content.ADDIE guides the training content and delivery inside the application. SSADM ensures systematic feasibility study, requirements gathering, logical design, physical design, and implementation and also for best for information systems and application development while the ADDIE (Analysis, Design, Development, Implementation, Evaluation) handles the training content that ensures the entrepreneurship modules are well-structured, effective, and measurable.

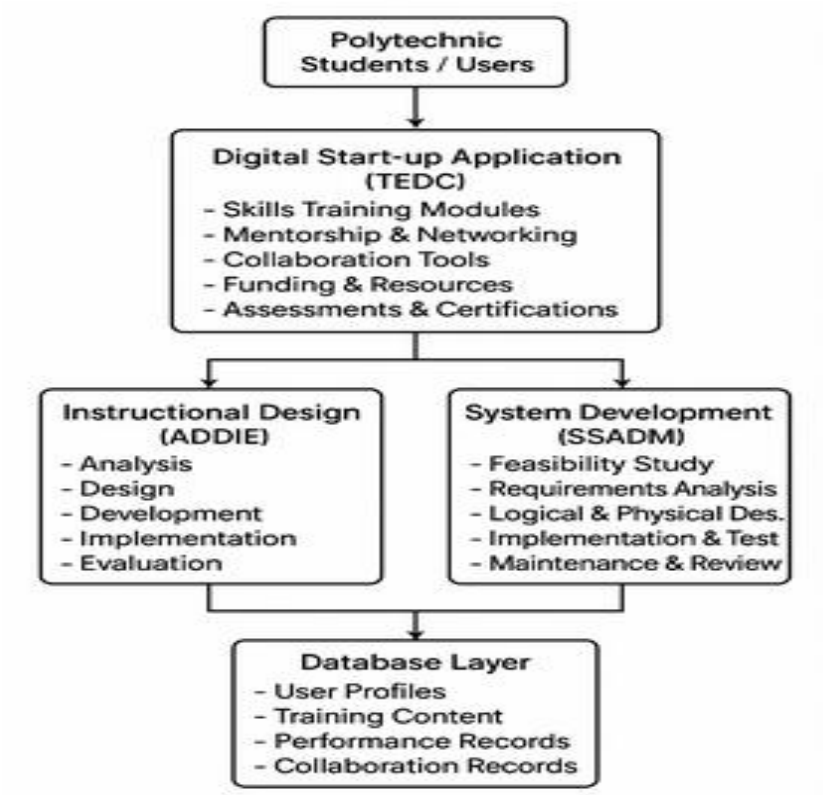
3.1.2 Data Collection

Qualitative: Focus group discussions and semi-structured interviews explored user needs and usability perceptions and also the use of secondary data collection.

3.2 System Development

It involves transforming user requirements into a working system through structured steps,

Diagram 3.1 Design Structure



Explanation of the Design Structure

3.2.1 User Layer (Target Group)

At the top, the **users** are Polytechnic students (primary beneficiaries), TEDC trainers/mentors, and administrators.

a) Students can access training modules, mentorship, and collaboration tools.
b) Trainers/Mentors provide guidance and evaluate performance.
c) Administrators manage system and content.

3.2.2 Application Layer (TEDC Digital Start-up App)

This is the front-end system the users interact with. It includes:

a) **Skills Training Modules** to interactive lessons on entrepreneurship, innovation, and business management.
b) **Mentorship & Networking gives** digital space to connect with mentors, peers, and investors.
c) **Collaboration Tools** are shared workspaces where students can work on projects.
d) **Funding & Resources** provide access to grant opportunities, competitions, and learning resources.
e) **Assessment & Certification** handles quizzes, tests, and certificates for skills gained.

3.2.3 Instructional Design Layer (ADDIE)

This layer ensures the training is effective.

a) **Analyses identify** gaps in student entrepreneurial skills.
b) **Design** plan curriculum and assessment methods.
c) **Development** creates learning modules, case studies, simulations.
d) **Implementation** delivers modules through the app.
e) **Evaluation** collects feedback and assesses outcomes (e.g., number of viable start-up ideas developed).

3.2.4 System Development Layer (SSADM)

This layer ensures the application is functional and reliable.

a) **Feasibility Study**: Determining if the project is viable.
b) **Requirements Analysis**: Defining user and system requirements.
c) Logical & Physical Design: Planning the system's architecture.
d) **Implementation & Test**: Building and testing the system.
e) **Maintenance & Review**: Ongoing support and updates.

3.2.5 Database Layer

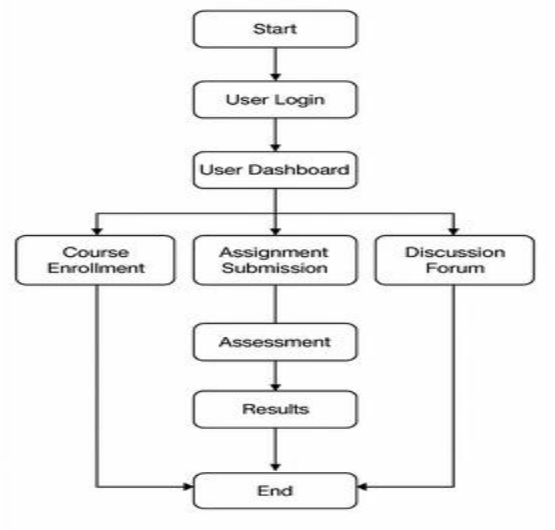
At the bottom, the database stores all essential information, such as:

a) **User Profiles** student data, mentor information.
b) **Training Content** modules, videos, documents.
c) **Performance Records** scores, certificates, progress reports.
d) **Collaboration Records** group projects, discussions, peer interactions.

3.2.6 How It All Works Together

a) Students log in to interact with the app modules.
b) The ADDIE framework ensures that what they learn is meaningful, structured, and measurable.
c) The SSADM methodology ensures the app runs smoothly as a digital platform
d) The databasesecurely stores learning content and student progress

3.2 High-Level Model of the Start-up Training Application



Data Flow (Steps)

Users register → Select skill courses → Access training content → Complete tasks and assessments → Progress saved in database → TEDC admin monitors performance and sends feedback → Certification issued upon completion.

4. Implementation

The applications were piloted for one semester as part of the TEDC training curriculum. Students used the tools to develop start-up concepts which were showcased in an end-of-semester demo day.

5. Results

Students could independently create a business model and basic financial plan. Secondly, the applications made training more interactive, motivating, and practical.

6. Discussion

Findings show that start-up applications are effective in bridging theory and practice in entrepreneurship training. The interactive and modular nature of the tools allowed students to experiment with business ideas and receive real-time feedback, improving engagement and skill acquisition. This also enables TEDCs to scale training without proportionally increasing instructor workload.

7. Conclusion and Future Work

This study demonstrates that integrating start-up applications into TEDC training significantly improves students' entrepreneurial competencies and start-up readiness. It is recommended that polytechnics institutionalize such digital tools within TEDCs. Future work will explore incorporating AI-based business advisory features and tracking graduates' entrepreneurial ventures post-graduation.

8. Summary

Digital Start-up Applications are online tools that empower aspiring entrepreneurs with training, mentorship, collaboration, and resources to start and grow businesses. Under TEDC in Polytechnics, they serve as digital incubators, preparing students with the entrepreneurial skills needed for innovation, job creation, and self-reliance.

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