Design and Development of e-COSMONESA: An E-Commerce Platform to Support Entrepreneurship Learning in Beauty Education

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Abstract. This study presents the design and initial development of e-COSMONESA, a specialized e-commerce platform aimed at supporting vocational students in Cosmetology Education programs in building entrepreneurial competencies. The research was conducted in two stages: (1) needs assessment through student surveys and a literature review on e-commerce platform design and market trends, and (2) system design and prototype development, which included use cases, activity diagrams, an Entity-Relationship Diagram (ERD), and user interface. The findings indicate that students require a platform that integrates business functionalities with educational support. The most desired features include a digital catalog (100%), online ordering (92,5%), secure payment systems (87,5%), and educational content (75%). The primary barriers identified were concerns over transaction security (92,5%) and gaps in digital literacy (72,5%). Additionally, 80% of respondents indicated a need for intensive training. The e-COSMONESA prototype was developed in response to these findings, laying the groundwork for future implementation and evaluation within the learning process.

Keywords: E-commerce, Vocational Education, Digital Entrepreneurship, Platform Design, e-COSMONESA.

Introduction

In the rapidly growing digital era, information technology provides significant opportunities in the transformation of various sectors, including vocational education and entrepreneurship. The Cosmetology Education Study Program has great potential to develop quality cosmetic products through COSMONESA's independent business unit. However, limitations in marketing reach and accessibility are major challenges that hinder the growth and sustainability of these businesses.

Along with the increasing adoption of digital technology, many business actors, including in the vocational education sector, are turning to digital platforms to improve efficiency, operational effectiveness, and market competitiveness. The use of e-commerce in the context of entrepreneurship education has been proven to enrich students' learning experiences through business simulations, online collaborative projects, and the application of practical skills in a real-world environment as well as supporting the development of practical skills through business simulations and online collaborative projects (Satrianny et al., 2024; Wahida et al., 2024)

E-commerce platforms such as e-COSMONESA can be a strategic solution to overcome market access barriers faced by cosmetology students. This application allows for integrated management of marketing, sales, and service-based education aspects, thereby strengthening student involvement in the digital entrepreneurship ecosystem. According to Sarwono & Jusuf, in 2023, the e-commerce revolution in Indonesia has facilitated MSME actors and the education sector in reaching consumers widely with more efficient operational costs. Data from the Central Statistics Agency shows that

internet penetration in Indonesia reached 73.7% in 2020, with the value of e-commerce transactions reaching Rp 337.7 trillion in 2021, indicating the huge potential of the digital market (Atmaja et al., 2024; Wahjusaputri & Nastiti, 2022). Therefore, the development of the e-COSMONESA application as a digital platform that supports marketing, sales, and education is an important step to support the business independence of the Cosmetology Education Study Program.

Digital entrepreneurship education is a strategic aspect in preparing the younger generation to face the increasingly complex dynamics of the digital economy. Millennials and Generation Z—who grow up in the technology ecosystem—have great potential to become drivers of innovation using digital platforms. However, this potential can only be optimized if they are equipped with the right digital entrepreneurial skills, ranging from technology literacy, business creativity, to digital-based risk management. A study by Imjai et al., (2025) emphasizes the importance of developing digital competencies for Gen Z business students so that they can adapt to the future digital-based work environment. Furthermore, Pranata et al., (2025) also underlined that Gen Z's entrepreneurial attitude is influenced by digital literacy, creativity, and tolerance for ambiguity—demonstrating the need for a curriculum that is integrated with a digital and growth-based approach (growth mindset). Thus, digital entrepreneurship education is not only a means of empowerment, but also an important instrument in producing young entrepreneurs who are adaptive and innovative in the era of industry 4.0 and society 5.0.

The integration of digital entrepreneurship education into the curriculum is also very important to prepare students to face changing market dynamics (Wisnujati et al., 2021). By utilizing technology and digital platforms such as e-COSMONESA, the Cosmetology Education Study Program can not only overcome marketing obstacles but also contribute to the development of entrepreneurship among students. This move will help create entrepreneurs who are innovative and ready to compete in the global market.

Methods

This research aims to develop e-COSMONESA, an e-commerce platform designed to support student business independence in the S1 Cosmetology Education Study Program, State University of Surabaya (UNESA). This study uses a Research and Development (R&D) approach, by adopting the ADDIE (Analysis, Design, Development, Implementation, Evaluation) instructional development model. This article focuses on the first two stages, namely the Analysis and Design stages. In the Analysis stage, an initial study was conducted to identify user needs, potential use of digital platforms, and obstacles faced in online entrepreneurial activities. The research sample consisted of 40 active students of the UNESA Cosmetology Education Study Program who were selected using purposive sampling techniques, based on their involvement in digital entrepreneurship activities or online selling experiences. Data collection was carried out through an online questionnaire distributed using Google Form (link: https://forms.gle/A2bzwhc7FEEKhzwz5). The questionnaire instrument included three main sections: (1) demographic data and online sales experience, (2) a 5-point Likert scale to measure expectations of app features and expected educational impact, and (3) open-ended questions regarding barriers, suggestions, and expectations for app development. The data obtained is descriptive, quantitative, and qualitative to support the application design process at the design stage, including feature specifications, user interfaces, and system logic flows. With this approach, the results of the analysis become a solid basis for designing digital solutions that are contextual and appropriate to the needs of the end user.

Result and Discussion

The study presents key findings from a questionnaire analysis of 40 students active in the Cosmetology Education program, focusing on demographic characteristics, entrepreneurial experience, feature expectations for the proposed e-COSMONESA application, barriers to adoption, and support mechanisms.

 1. **Demographic Profile and Online Sales Experience**

As illustrated in Table 1, all respondents (100%) were female, aged 20-25 (90%) or under 20 years old (10%). This demographic represents a digitally proficient group of entrepreneurs with high potential for e-commerce adoption.

Table 1. Respondent Demographics

Characteristics	Category	Frequency	Percentage (%)
Gender	Woman	40	100%
Age	<20 years old	4	10%
	20–25 years old	36	90%
Status	Active Cosmetology Students	40	100%

Meanwhile, Table 2 reveals that 80% have previous experience selling cosmetics online, mainly through WhatsApp (75%), followed by Shopee (9.4%) and Instagram (6.3%). WhatsApp's dominance highlights the preference for an informal relationship-driven platform, suggesting students take advantage of existing social networks rather than structured e-commerce ecosystems. This trend underscores the need for e-COSMONESA to bridge informal sales practices with formal digital entrepreneurship tools.

Table 2. Experience and Platform for Selling Makeup Products Online

Category	Sub-Category/Platform	Number of Respondents	Percentage (%)
Online Sales Status	Ever Sold	32	80%
	Never Sold	8	20%
Platforms Used (if selling)	WhatsApp	24	75% (of 32)
	Shopee	3	9.4% (of 32)
	Instagram	2	6.3% (of 32)
	TikTok Shop	1	3.1% (of 32)
	Other	1	3.1% (of 32)

2. Expectations for Core and Educational Features

Respondents unanimously (100%) prioritized visually appealing product/service catalogs as important (**Figure 1**). High demand was also observed for integrated e-commerce functionality: online ordering (92.5%), secure digital payments (87.5%), direct-customer seller chat (87.5%), and product reviews (87.5%). It reflects expectations for seamless, secure, and interactive transactions that align with industry standards.
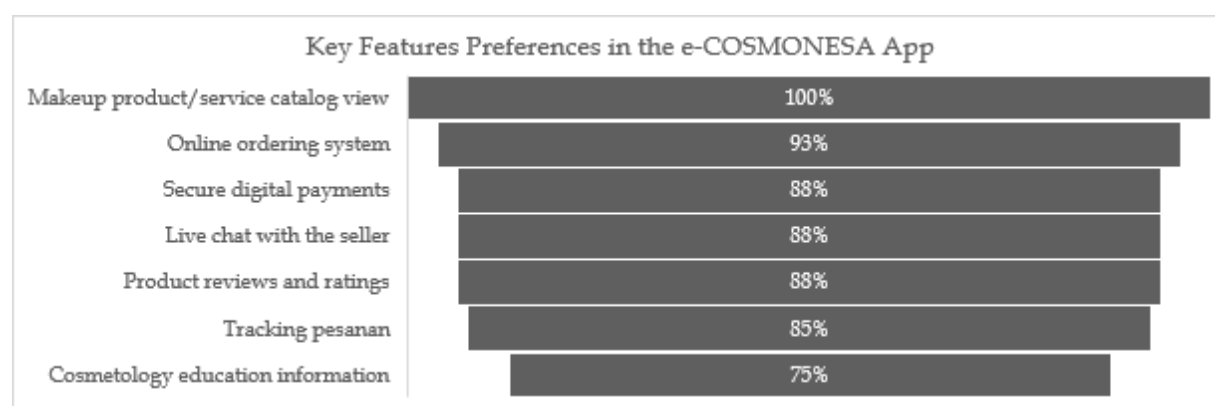

Figure 1. Key Features Preferences in the e-COSMONESA App

For Education-related features, a significant 75% emphasized the need for embedded educational content (e.g., makeup tutorials), reinforced by Table 3: 77.5% (52.5% strongly agree; 25% agreed) affirmed the value of educational features. This dual demand positions e-COSMONESA as a commercial platform and capacity building tool, serving students' dual roles as learners and new entrepreneurs.

Table 3. Respondents' Perception of Education Features in the e-COSMONESA Application

Shoes Likert	Interpreters	Frequency (n)	Percentage (%)

| 5	Strongly agree	21	52,5%
4	Agree	10	25,0%
3	Neutral	9	22,5%
2	Disagree	0	0,0%
1	Strongly Disagree	0	0,0%
Total		40	100%

3. Barriers to Adoption

As seen in **Figure 2**, the main barriers to the adoption of digital payment systems include concerns about transaction security (92.5%) which reflects the low level of public trust in the system. In addition, limited technology literacy (72.5%) is also an obstacle, even though most respondents come from the digital native generation. Another factor that also hinders is inadequate internet infrastructure (65%), especially in areas with low connectivity. Addressing these challenges requires strategic solutions such as the implementation of robust security protocols (e.g., verified payment gateways), the development of user-friendly interfaces, and support for features that remain optimal even under low bandwidth conditions, to ensure inclusive and sustainable access for all levels of society.
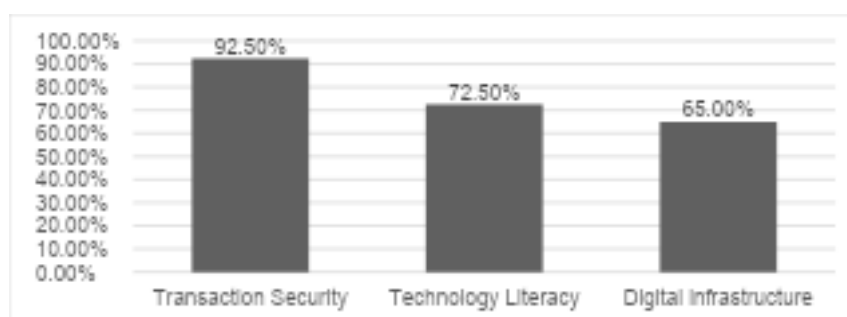
Figure 2. Main Barriers to Using the e-COSMONESA Application (N = 40)

4. Required Support Mechanisms

Most respondents (80%) stated the need for comprehensive training and mentorship (see **Figure 3**), which indicates a gap between theoretical digital familiarity and practical competence in e-commerce.
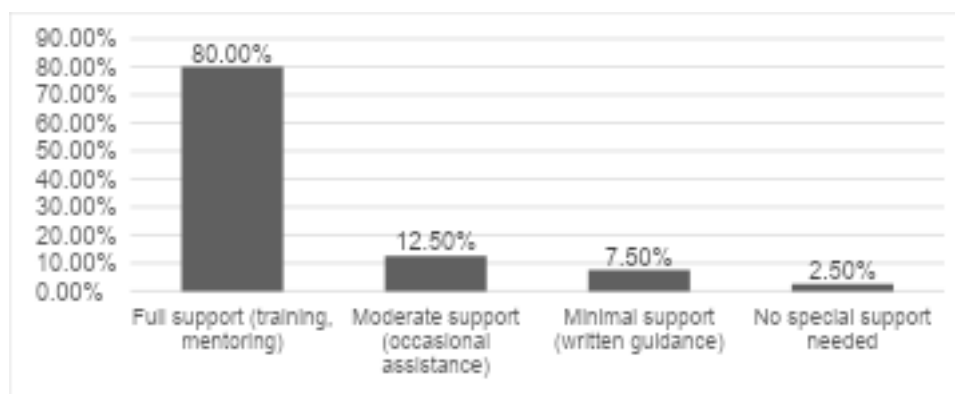
Figure 3. Support Required to Use the e-COSMONESA App (N=40)

The qualitative feedback shown in Table 4 further emphasizes six key expectations, namely: support in marketing (such as digital catalogs and product search features), availability of business management tools (including inventory management, customer and financial tracking), provision of educational resources (such as webinars and certifications), involvement of pre-graduate students in entrepreneurial practices, increased accessibility (through lightweight design that supports multi-platform), and expanding market reach through brand recognition at the national level. These findings

demonstrate the importance of a human-centered design approach, integrating elements of technical and pedagogical support to accelerate and facilitate an effective adoption process.

Table 4. Respondents' Expectations (Open Question)

No.	Theme of Hope	Brief Description
1	Promotion and Marketing	The application helps promote products/services to a wide range of customers, catalogs and product search features are available.
2	Business Management	Manage transactions, stock, customers, and financial statements digitally and efficiently.
3	Education and Training	Available training, beauty tips, video tutorials, webinars, and online certifications.
4	Student Inclusivity	Helping students develop their business before graduation, becoming a learning space for entrepreneurial practice.
5	Accessibility and Technology	Available in a website version, easily accessible to everyone, it doesn't take up much space on your phone.
6	Branding and Market Reach	The application is widely known, not only the campus scope, supporting national market penetration.

5. Application Design and Prototyping

a.   User Case Diagram

The first step in the development of the e-COSMONESA application is to establish a User Case Diagram as shown in **Figure 4** to identify roles and interactions in the system. Three main actors are determined, namely Students/Service Providers, Customers, and Admins. Each actor interacts with specific use cases, such as product uploads, service orders, access to educational content, and sales execution. This model reflects a system structure based on a user-centered approach, where the role of the user is central to the design of the system (Fatmi & Malviya, 2024)

Figure 4. e-Cosmonesa Interaction System (Anggaraeni & Patrie, 2022)

b.   Diagram of Activities User

The User Activity Diagram in **Figure 5** shows the operational flow in the application, starting from the search for products by the Customer, to the receipt of services or goods. The transaction process includes payment verification by the system and service preparation by the Admin or Service Provider Partners. This approach demonstrates the complexity of systems that involve multi-stakeholder coordination and enables digital portfolio-based collaboration, catalogs, and automated checkout features.
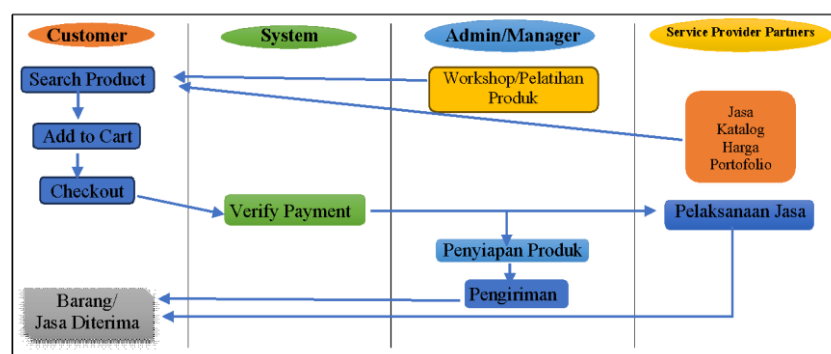

Figure 5. User Activity of the e-COSMONESA application

c. Entity and Relationship Diagram (ERD)

In **Figure 6** of the Entity Relationship Diagram (ERD), the system is designed in a modular manner to support the vocational learning process and digital transactions. The main entities include Admin, Product, Services, Payments, and Users. This ERD explicitly supports entrepreneurial learning—a concept where students are not only students, but also digital economy actors.
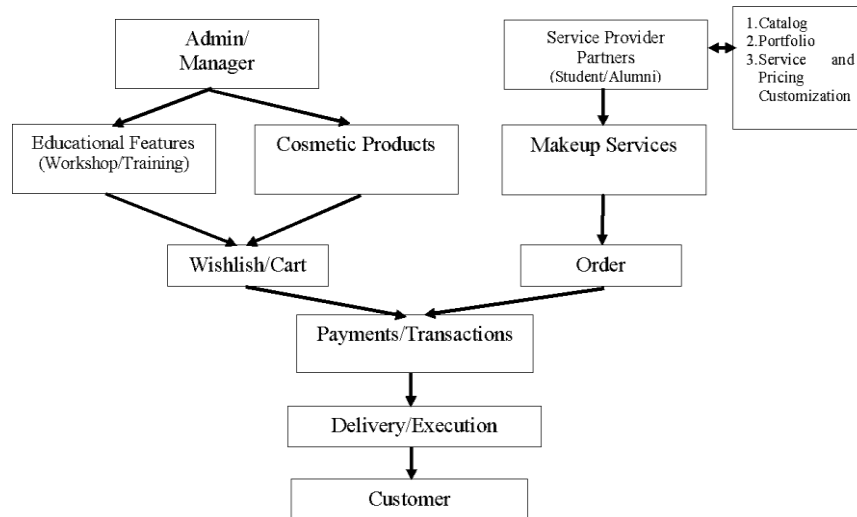

Diagram 2. *Entity Relationship Diagram*/ERD
Figure 6. Entity Relationship Diagram (ERD)

Emma, 2024 emphasizing the importance of information system structures that facilitate the dual role of users as learners and service providers. The use of functional ERD contributes to the achievement of operational efficiencies and clear role mapping in e-commerce-based educational platforms.

d. User Interface (UI) Design

The e-COSMONESA application is designed with the principle of user-centered design (UCD), using PHP, MySQL, and Bootstrap. The interface design prioritizes user comfort, quiet visual aesthetics, and easy navigation. Components such as sticky navigation bars, prominent Call-to-Action buttons, and responsive UI integration support multi-platform adaptations, including mobile devices. shows that the UCD approach is very effective in building a digital system that can increase user satisfaction and facilitate the educational process based on digital platforms (Gaol, 2024).
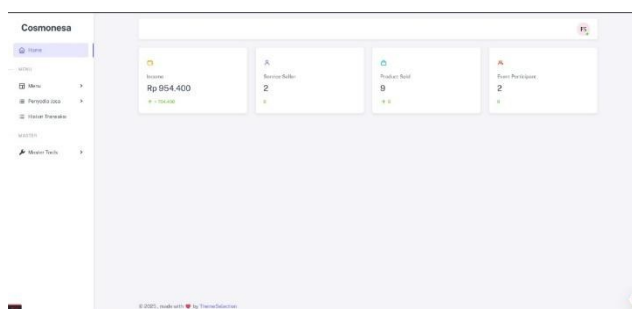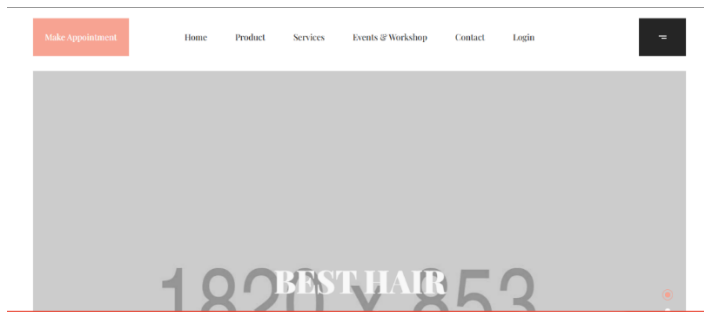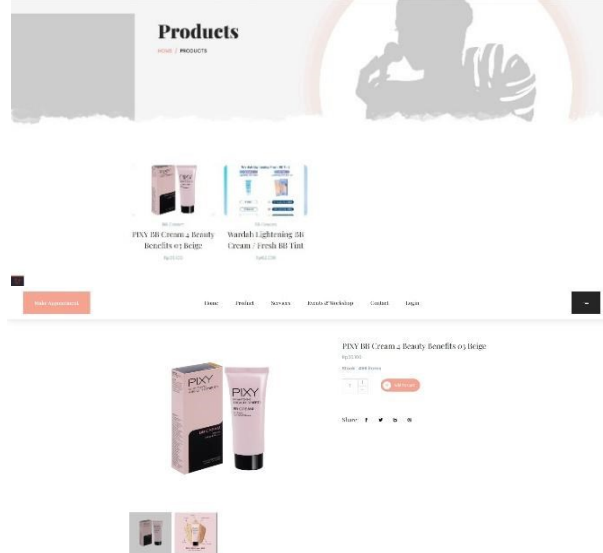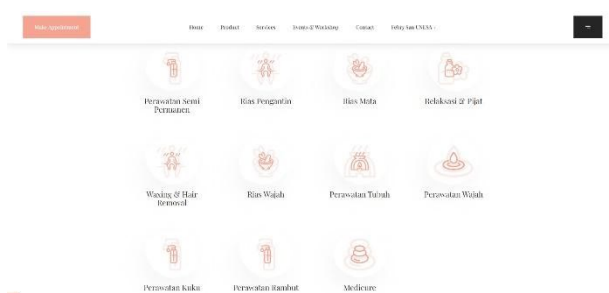
7a. Front Page   7b. Admin Page

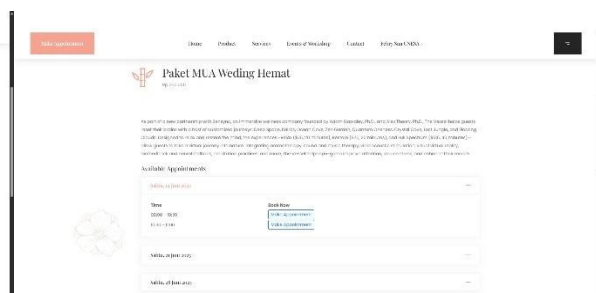**Figure 7**. Cosmonesa App Front Display and Admin
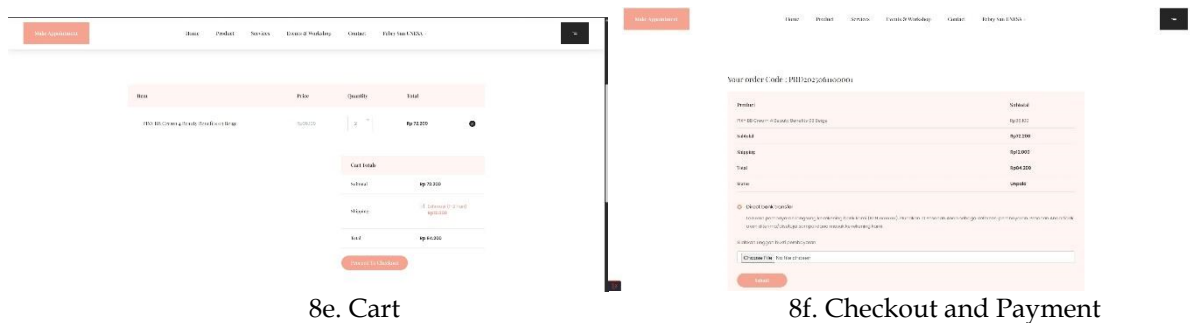

8a. Product Catalog   8b. Detail Product


8c. Services Category   8d. Service Detail

8e. Cart   8f. Checkout and Payment

Figure 8. Product Catalog, Transaction and Sales Features

e. Integration of Vocational Education Needs

The platform features educational features such as training dashboards, workshop catalogs, and access to learning modules. This approach is in line with the principles of digital educational design as highlighted by which states that user-centered vocational platforms can bridge the gap between theory and practice, especially in the context of job skills such as cosmetology (Hosseini et al., 2022).
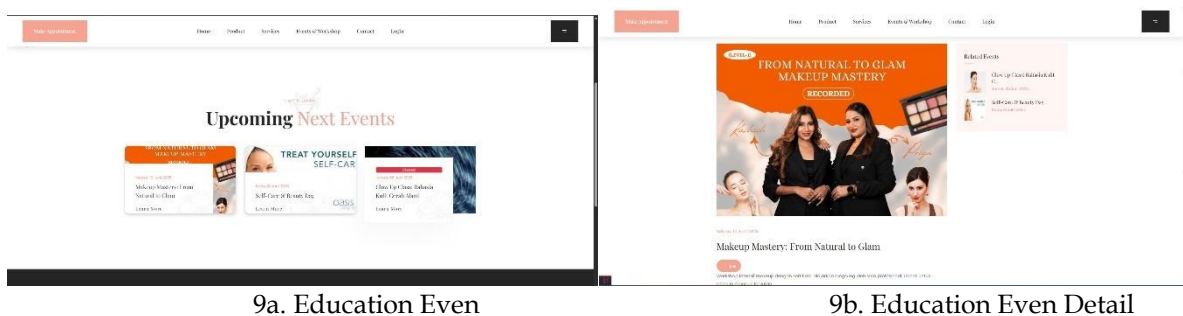
9a. Education Even   9b. Education Even Detail

Figure 9. Educational Features

Discussion

The results of this study highlight the synergistic dynamics as well as conceptual tensions in the development of education-based e-commerce platforms for vocational students. Students' significant preference for the use of WhatsApp as the primary communication medium reflects the disparity between the informal digital practices that have been formed and the formal forms of digital entrepreneurship that are to be built. This gap is a major challenge that needs to be bridged by e-COSMONESA through the integration of participatory social features while maintaining a secure structural framework, for example through a strict payment verification and security system.

The high demand for educational content supports the findings, which emphasize the importance of personalized user experiences in digital environments. These findings indicate that e-COSMONESA has the potential to be a pioneer in the concept of "edutainment-based commerce" in the context of cosmetology education, where learning processes and commercial activities are integrated (Ivanova et al., 2021).

However, structural constraints such as low technological literacy and limited internet infrastructure remain significant contextual barriers. Even digital native groups still need additional support in the form of scaffolding or digital scaffolding, which leads to the need for repetitive and continuous training. This is in line with Nguyen's (2020) statement calling for the importance of system design that emphasizes user credibility and trust. The app's initial prototype attempted to respond to the issue through the implementation of a simple Bootstrap-based interface, but the success of long-term implementation relied heavily on strong institutional support, such as the provision of equitable and sustainable internet access (Thi & Nguyen, 2020).

Overall, the development of e-COSMONESA requires a strategic balance between four fundamental elements, namely: trade (transaction), education (skill development), trust (trust and security), and

accessibility (inclusivity). Future iterations of development are suggested to integrate Augmented Reality (AR) technology to enable virtual simulation or product testing, as well as expand the network of partnerships with service providers to expand market reach and strengthen the digital entrepreneurship ecosystem in the vocational education sector (Thamanda et al., 2024)

Conclusion

This research shows that e-COSMONESA has strong potential as an educational e-commerce platform for Cosmetology Education students. With most respondents being women of productive age and having informal online buying and selling experience, the app needs to bridge existing social practices with a more structured digital entrepreneurship system. Respondents strongly expect secure, interactive, and visually appealing transaction features, as well as educational content such as tutorials. However, key challenges of low-tech literacy, security concerns, and infrastructure limitations must be addressed through user-friendly interface design and training support. The initial prototype demonstrates a response to this need through the integration of educational and transactional modules. The success of long-term implementation depends on the synergy between technological innovation, ongoing training, and institutional support.

Acknowledgments

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