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Empowering Students with Entrepreneurial Skills and Alternative Income through Guppy Cultivation in the P2MW Program

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ABSTRACT

Entrepreneurial skills are crucial for the younger generation's adaptation to the creative economy. Higher education has a strategic role in producing graduates capable of innovative businesses. The Student Entrepreneurship Development Program (P2MW) aims to strengthen the campus entrepreneurial ecosystem through coaching, mentoring, and training. However, research specifically evaluating P2MW's role in developing student business skills in economically promising sectors like guppy farming is limited. This study examines P2MW's effectiveness in improving entrepreneurial skills among PGRI Delta University students in guppy farming, including technical, managerial, income, impact, and challenges. Using a qualitative case study with interviews, observation, and document analysis of three student participants, the research found that P2MW significantly enhanced entrepreneurial skills, technical knowledge, sustainable income, and economic independence. Results show substantial increases in sales (48%), revenue (34,94%), and guppy variants (400%) through effective hybrid marketing and financial management. The program successfully integrated technical and managerial aspects, creating a replicable business model and sustainable income. This study enriches practice-based entrepreneurship education literature and offers a model for higher education, with potential for replication in other agribusinesses and providing practical program development recommendations. Further research with more participants and longer tracking is suggested.

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Introduction

Entrepreneurial skills are an essential core competency that the younger generation must grasp to navigate the dynamics of creative economic development. (Bardales-Cárdenas et al., 2024). Higher education institutions can prepare graduates to perform academically while also launching and growing creative businesses. (Pacheco et al., 2023). The Student Entrepreneurship Development Program (P2MW) is an essential effort that encourages students to develop an entrepreneurial mindset. This program aims to strengthen the campus's entrepreneurial environment by hosting a series of integrated business coaching, mentorship, and training activities. P2MW is an implementation of the Merdeka Belajar Kampus Merdeka (MBKM) policy, which specifically aims to improve students' practical skills in the field of entrepreneurship, thereby contributing to inclusive and sustainable creative economic growth (Ditjen Diktiristek-kemendikbudristek, 2024a). As confirmed by (Suhartanto, 2024), business coaching within entrepreneurship programs positively impacts students' ability to develop products, improve managerial practices, and address financial and legal challenges. Skills are essential for increasing adaptive capacity and readiness to navigate the uncertainties of entrepreneurial ventures.

At PGRI Delta University, the implementation of the Student Entrepreneurship Development Program (P2MW) is focused on facilitating students in developing businesses that utilize local potential. One of the most important sectors is ornamental fish farming, namely for guppy fish (Poecilia reticulata). Guppy fish are considered one of the most desirable commodities in the ornamental fish industry due to their beautiful colors, variety of patterns, and ease of maintenance. These features make guppies a high-value export product, physically appealing, and particularly the male kind. (Harun et al., 2022). Guppies have a high commercial potential, both locally and globally, due to their distinctiveness and color variation. The intensity of these fish's unusual colors and patterns has a considerable impact on their economic worth, with male guppies being more popular due to their more striking hues. This phenomenon is consistent with the results of (Sharma, L., & Singh, 2024), who showed that secondary sexual features in male guppies, such as bright coloring, are important factors in market price, particularly in animals with high sexual dimorphism.

Guppy farming is very strongly linked to regional and local market circumstances. This industry is ideal as a first business opportunity for university students because of its relatively short production cycle, low operating expenses, and simplicity of management. This not only opens up commercial options but also stimulates innovative entrepreneurship based on local resources (Somwethee et al., 2023). To optimize the development of pupils' entrepreneurial spirit, a multifaceted strategy is required. The combination of entrepreneurship education, relevant practical training, and technology use is critical in developing a strong entrepreneurial mindset. This is backed by research. (Agrita et al., 2023)This demonstrated that a training program focused on creativity and innovation might dramatically improve students' self-confidence and business planning skills.

These programs not only help students develop entrepreneurial skills, but they also provide alternate sources of income for them. According to studies, entrepreneurship aid programs help students develop their entrepreneurial skills. As an example, (Edokpolor, 2020) It was revealed that entrepreneurship education improves the relationship between entrepreneurship education and sustainable development principles by increasing students' entrepreneurial abilities. Similarly, (Mujtaba et al., 2025) Entrepreneurship education has been shown to have a significant influence on shaping students' entrepreneurial goals by increasing entrepreneurial motivation, awareness, and competencies.

Furthermore, entrepreneurship assistance programs have been shown to increase freshman entrepreneurial inclinations. (Hoang et al., 2021) It was shown that entrepreneurship education in higher education had a positive impact on students' aspirations to establish creative businesses, with an entrepreneurial mindset functioning as a mediating element. (Wardana et al., 2020) have discovered that entrepreneurship education has a significant influence on students' self-efficacy and entrepreneurial attitudes, hence promoting the development of a strong entrepreneurial mentality. Furthermore, (Hoang et al., 2021) self-efficacy and learning orientation were revealed to be mediators in the association between entrepreneurship education and entrepreneurial desire among Vietnamese university students. These findings show that entrepreneurship aid programs not only give practical knowledge and abilities but also assist university students in developing strong entrepreneurial attitudes and intentions. As a result, adding such programs to higher education curricula is strongly recommended to help university students develop their entrepreneurial skills. According to several studies, experiential entrepreneurship programs help students improve their technical and strategic management abilities.

Several studies suggest that experiential entrepreneurship programs increase students' technical and strategic abilities in operating enterprises in certain economic sectors, while also encouraging local economic growth and innovation. (Egana-delSol et al., 2023; McLachlan et al., 2024). Despite the potential societal and personal benefits of guppy farming, difficulties, including shifting input and product costs, continue to be a concern. (Riandi et al., 2022). However, financial feasibility analysis in guppy marketing demonstrates that knowing business elements is just as crucial as technological ability (Zuhri et al., 2021). Furthermore, technical aspects such as light color fluctuation influence fish development and behavior, which is crucial for aquaculture optimization (Almaas et al., 2023). In terms of sustainability, (Chen et al., 2023) Demonstrated that ecological awareness and environmental legislation may stimulate the adoption of ecologically friendly technology in the agricultural sector, a strategy that might be sustainably utilized in guppy farming enterprises.

Entrepreneurship programs like P2MW have been demonstrated to boost students' locus of control, which raises their interest in entrepreneurship. (Dani et al., 2024). Furthermore, interactive and immersive learning methodologies are useful in increasing students' skill development through entrepreneurship training. (Wang et al., 2023). The program's effectiveness also depends on tailoring it to the requirements of the participants and creating a supportive atmosphere. (Morris et al., 2023). Furthermore, research suggests that entrepreneurship education in higher education has a positive impact on students' intention to establish creative enterprises, with an entrepreneurial mindset functioning as a mediating element. (Hanandeh et al., 2021; Hoang et al., 2021; Wardana et al., 2020).

Entrepreneurship education affected students' self-efficacy and entrepreneurial attitudes, all of which help to create a strong entrepreneurial mentality. Entrepreneurship programs can help to increase alternative income for university students. As an example, research by (Chakravarty et al., 2019) In Nepal, entrepreneurship training dramatically raised participants' monthly income, particularly among women who launched their enterprises from home. Likewise, the research by (Mahmood et al., 2020) It has been established that campus entrepreneurship initiatives may provide self-employment possibilities and help students achieve economic independence.

However, research on the effect of the Student Entrepreneurship Development Program (P2MW) in enhancing student business abilities in the guppy farming industry is sparse. In reality, this sector has enormous economic potential, but little is known about how P2MW promotes the development of technical skills, marketing strategies, and institutional backing. Therefore, this study intends to fill the gap by investigating in depth the efficiency of P2MW in increasing the entrepreneurial abilities of PGRI Delta University students. The focus of the study includes analysis of technical and managerial skills, contribution

to sustainable alternative income, measurement of economic impact, and challenges faced in business management. The results are expected to enrich understanding and provide practical recommendations for the development of entrepreneurship programs in higher education.

Literature Review

Entrepreneurship Theory

Entrepreneurship is a natural phenomenon in the business world that reflects the health and dynamics of business organizations. According to (Diandra & Azmy, 2020)Entrepreneurship is an integral part of business life, which indicates that businesses are in a healthy condition when entrepreneurial and management skills are adopted for change and learning. Entrepreneurial characteristics encompass a wide range of traits and talents that contribute to business success. (Xie et al., 2021) Identified four essential traits of an entrepreneur: sociability, planning, leadership, and innovativeness, all of which have a substantial impact on entrepreneurial ambitions. Entrepreneurship is critical to the economy's growth and job creation. According to the (OECD, 2020)Entrepreneurship is an important engine of job creation, economic growth, and social cohesion.

Entrepreneurship development in higher education is an intentional effort to equip students with the skills and mindset needed to establish and run businesses. Several programs and efforts have been created to stimulate the entrepreneurial spirit among students, ranging from entrepreneurship courses, company incubators, and business plan competitions. (Ditjen Diktiristek-kemendikbudristek, 2024b). These programs aim to not only increase theoretical knowledge about entrepreneurship but also provide practical experience through mentoring and training. (Wang et al., 2023). The integration of formal education and hands-on experience is considered crucial in shaping successful entrepreneurs. (Agrita et al., 2023)Collaborative initiatives that combine entrepreneurship theory learned in classrooms with real-world practice, such as those found in university entrepreneurship development programs, have been shown to increase students' motivation to build businesses independently. (Pramudita, 2021)

Despite increased efforts to foster entrepreneurship through higher education, practical hurdles remain, particularly in specific areas such as aquaculture. Student entrepreneurship in the aquaculture sector, notably guppy farming, encounters a variety of technical and non-technical challenges. Technical issues include water quality management, disease control, and optimal cultivation practices. (Almaas et al., 2023). Non-technical constraints such as limited market access, poor marketing strategies, insufficient financial literacy, and a lack of business networks continue to stymie firm growth. (Rusdiana, 2022). These limits emphasise the significance of thorough and long-term mentorship to help students overcome practical challenges and maximise their entrepreneurial potential.

Previous studies have found that entrepreneurship education has a significant influence on students' entrepreneurial inclinations. (Sun et al., 2023) It was shown that entrepreneurship education, both official and extracurricular, greatly boosted students' entrepreneurial mindset, hence boosting their entrepreneurial intention. (Ingsih et al., 2024) Entrepreneurial competence, motivation, and self-efficacy were found to have a direct influence on entrepreneurial intention among Indonesian Generation Z college students. Furthermore, (Indriyani, 2017) Revealed that entrepreneurship education had a significant influence on students' entrepreneurial intents, with entrepreneurial motivation acting as a bridge and deepening the relationship. Institutional support, parental role modeling, and entrepreneurial self-efficacy have all been shown to improve students' entrepreneurial goals. Overall, our findings emphasize the importance of a complete approach to entrepreneurship education that includes cognitive, affective, and contextual variables

to nurture entrepreneurial spirit in students.

Student Entrepreneurship Development Program (P2MW)

The Student Entrepreneurship Development Program (P2MW) is one of numerous national attempts to encourage and promote the entrepreneurial spirit among Indonesian students (Ditjen Diktiristek-kemendikbudristek, 2024a). P2MW offers financing, training, and mentorship to students with business ideas or who have previously run a business. This curriculum is meant to produce graduates who are not just looking for work but also capable of producing jobs and contributing to the national economy. (Dani et al., 2024). P2MW has a significant positive influence on student business growth, resulting in increased production capacity, market expansion, and turnover rates. Furthermore, the initiative improves the entrepreneurial environment in higher education through collaboration with business incubators and other organizations. (Universitas Ahmad Dahlan, 2024)

The P2MW curriculum is structured into stages, from the Initial Stage to the Growing Stage, all of which are intended to assist students in developing their businesses. Training, coaching, and assessment are provided at each level to support the business's long-term health and growth. P2MW also encourages company growth in specific areas such as agribusiness, fishing, fashion, and digital. For example, using this technique, a group of students from the University of Bangka Belitung successfully developed a fashion business based on Cual traditional cloth, thereby enhancing economic value while also maintaining local culture. (Universitas Bangka Belitung, 2024). However, implementing P2MW presents various challenges, including limited resources, a lack of business skills among students, and the need for ongoing coaching. Overcoming these challenges requires consistent support from various parties, including the government, universities, and the industrial sector. (Universitas Ahmad Dahlan, 2024).

Economic Potential of Guppy Fish Farming (Poecilia reticulata)

Guppy fish (Poecilia reticulata) aquaculture has tremendous economic potential due to steady market demand and is predicted to develop in both domestic and foreign markets (Harun et al., 2022). Guppies offer various benefits, including a range of appealing colors and patterns, ease of upkeep, and a relatively rapid reproductive cycle. (Riandi et al., 2022). The ornamental fish market, which includes guppies, is expanding in tandem with the growing public interest in aquariums. Furthermore, modifications in cultivation and marketing strategies can raise the value of guppy goods. (Zuhri et al., 2021). Indonesia's ornamental fish export value reached USD 30.76 million in 2020, USD 34.55 million in 2021, and USD 36.43 million in 2022, suggesting consistent development in the business. (Kementerian Kelautan dan Perikanan, 2023). Although detailed data on guppies' contribution to this export value is unavailable, guppies are one of the most popular ornamental fish species and contribute to this number.

The guppy market category caters to a diverse spectrum of customer groups, including children and adults who are both aquarium enthusiasts and small-scale breeders. The primary buyers of guppies are ornamental fish enthusiasts searching for a range of distinctive colors and forms, as well as breeders interested in the guppy's quick reproductive capacity and simplicity of care. (Zuhri et al., 2021). However, guppy farming presents several obstacles. One of the biggest problems is the availability of high-quality fry in adequate quantities, which might impair the production and quality of cultured goods. (Zamhari, 2023). Furthermore, fierce rivalry in the ornamental fish industry, a lack of awareness about successful marketing methods, and limits in resource management are also challenges in the development of guppy farming. (Zamhari, 2023)

Methodology

This study used a qualitative case study technique to investigate how the Student Entrepreneurship Development Program (P2MW) influences the guppy fish farming firm operated by PGRI Delta University students. Case studies were chosen because they are able to describe real experiences in depth, especially in a specific business context (Ghanad, 2023).

This study concentrated on one business unit, Guppy Darjo, which is run by three active students. This company was selected because it received money from the P2MW program in 2023 and has shown consistent growth throughout the program. Furthermore, this company is actively participating in all stages of the program and has comprehensive documentation; thus, it is regarded as eligible for study.

Data collection was conducted through three techniques:

1. Interviews with the three student business owners,
2. Direct observation of business activities, and
3. Document analysis, such as financial statements, sales data, and promotional materials.

Guppy Darjo was chosen not only because it was funded by P2MW, but also because its business reflects the main objective of the program-combining innovation and sustainability in real practice. A combination of interviews, observations, and document analysis was used to strengthen the validity and depth of the findings (Bell et al., 2023).

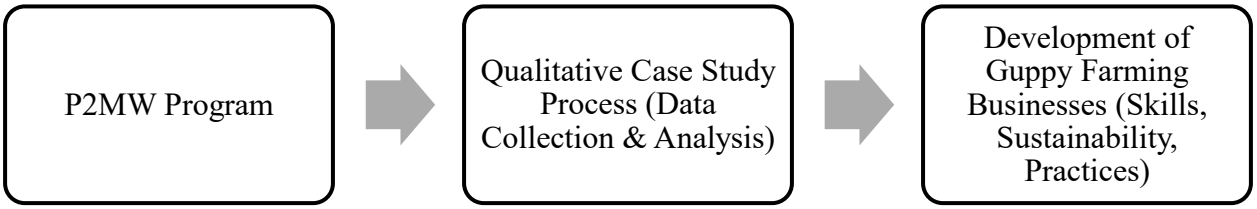

Figure 1. Research Model

Source: Data arranged by authors (2025)

Data were analyzed using thematic analysis techniques to find key patterns or themes relating to enterprise development, particularly in terms of skills, innovation, and sustainability. The main objective of this research was to understand the process and its impact, not to statistically test hypotheses. As stated by Rohwana et al. (2024), researching student enterprises directly helps to understand how they learn and develop through field experiences and interactions with the community.

Results and Discussion

Result

Guppy Darjo Profile

This study focused on three male students actively involved in the P2MW Guppy Aquaculture Program, representing the aquaculture, marketing, and finance divisions. The informants, identified by the initials MKA (age 23), MSA (age 22), and MABS (age 22), are undergraduate students majoring in English Education (MKA) and Mathematics Education (MSA and MABS) at PGRI Delta University. They have been engaged in guppy fish farming for four, two, and three years, respectively, prior to and during their participation in the program. In 2021, these students co-founded Delta Guppy Farm, with MKA as aquaculture leader, MSA handling marketing operations, and MABS overseeing financial planning and

reporting. The company's main product is high-quality decorative guppy fish, which are sold through both online and offline channels. The enterprise was founded in response to a lack of part-time employment alternatives and a common interest in sustainable aquaculture as a source of student income. The company now works on a national scale, servicing orders from all across Indonesia using e-commerce platforms and social media marketing. In-depth interviews and qualitative data analysis gave a full understanding of the program's approach, problems, and economic effects. According to the data, the Student Entrepreneurship Development Program (P2MW) considerably increases entrepreneurial abilities among PGRI Delta University students engaged in guppy farming. The curriculum improves technical knowledge and business skills, creates long-term earning prospects, and encourages student economic independence.

Guppy Fish Farming as Environmental Entrepreneurship

The P2MW program gives participants firsthand experience in an environmentally conscious enterprise. Students innovate early, utilizing used gallon waste as rearing media. Observations confirm that this recycling reduces production costs by up to 30% and promotes sustainability. Students also adopt data-driven technical approaches, including superior broodstock selection, water quality management, and feed efficiency. This technical skill development aligns with (Agrita et al., 2023), who found that practice-based training enhances students' self-confidence and abilities.

Quantitative Results of Program Impact

Quantitative data from June to October 2024 shows improvements:

- Fish sales increased from 200 to 296 pairs (48%).
- Revenue increased from IDR 12.840.000 to IDR 17.325.000 (34,94%).
- Guppy variants increased from 2 to 10 types (400%).

The "Guppy Darjo" business model expanded the market beyond the island.

Table 1. Comparison of Guppy Harvest Results Before and After the Student Entrepreneurship Development Program (P2MW)

No	Category	Before P2MW	After P2MW	Improvement (%)
1	Number of Fish Sold	200 pairs	296 pairs	48
2	Turnover	IDR 12.840.000	IDR 17.325.000	34,94
3	Guppy Fish Type	2 type	10 type	400

Source: Data arranged by authors (2025)

Effective Hybrid Marketing Strategy

Figure 1. Digital and Community-Based Marketing Strategy

Source: Data arranged by authors (2025)

The marketing strategy combines digital and community approaches (hybrid marketing), as shown in Diagram 1. Digital channels include Instagram, Facebook, and WhatsApp. Offline strategies involve exhibitions and collaboration with ornamental fish communities. This hybrid approach contributed to a 134.93% turnover increase from June to October 2024. Customer testimonials and direct interaction-built brand credibility and loyalty.

Financial Management and Cost Efficiency

P2MW grant funds are managed with discipline and transparency. Budget documents show proportional allocation for production, promotion, and business development. Efficient expenditure on media and feed is achieved through innovations such as the use of recycled gallon containers for breeding and maintenance, which reduces operational costs while maintaining fish quality. Quantitative data from June to October 2024 demonstrates significant improvements: fish sales increased from 200 to 296 pairs (48%), revenue rose from IDR 12.840.000 to IDR 17.325.000 (34,94%), and the number of guppy variants expanded from 2 to 10 types (a 400% increase).

These figures indicate both cost efficiency and profitability, as operational strategies and market innovation led to measurable business growth. Moreover, the "Guppy Darjo" business model successfully expanded its reach beyond Java, marking a transition from a local to a national market presence. The structured training and mentoring provided by the P2MW program played a critical role in developing these financial management skills, helping students enhance their budgeting accuracy, spending prioritization, and income tracking, thereby fostering not only business acumen but also personal financial literacy that supports their academic and living expenses.

Integrated Division Synergy

The student team's success is the result of collaboration across the aquaculture, marketing, and finance sections. The aquaculture section enhances guppy quality and diversity by creating new color strains and breeding methods. These inventions are subsequently relayed to the marketing department, which

creates promotional material and sales tactics that highlight distinguishing traits like uncommon colors or hybrid varieties. For example, when the aquaculture team successfully produced the "Albino Full Red" guppy variation, the marketing department launched a focused campaign on Instagram and Shopee to entice collectors, while the finance division adjusted the pricing model based on feed costs and market demand to ensure profitability. This correlated workflow necessitated weekly cross-divisional meetings to assess progress and realign strategy, so encourage responsibility and adaptive learning. The Student Entrepreneurship Development Program (P2MW) was crucial in honing these collaborative abilities by offering structured mentoring, division-based company development seminars, and simulation-based training that stressed integrated cooperation. This partnership not only improves day-to-day operations but also creates a dynamic learning ecosystem that simulates real-world business contexts, preparing students for professional entrepreneurial challenges.

Economic Impact, Productivity, and Student Independence

P2MW greatly improves student productivity and revenue. Sales improved, and turnover reached IDR 17.325.000 on a constant monthly basis, exceeding the typical part-time income in East Java. Guppy farming provides a more productive income than traditional part-time labor.

Students faced challenges balancing academics and business operations, particularly time management. They addressed this through collaborative work models, rotations, and flexible schedules. This highlights the need for institutional support for student entrepreneurship, such as integrating it into academic projects. The guppy farming initiative demonstrates long-term potential. The "Guppy Darjo" model is profitable and replicable, with the potential to evolve into a campus-based incubator or cooperative. This aligns with Merdeka Belajar Kampus Merdeka (MBKM) objectives.

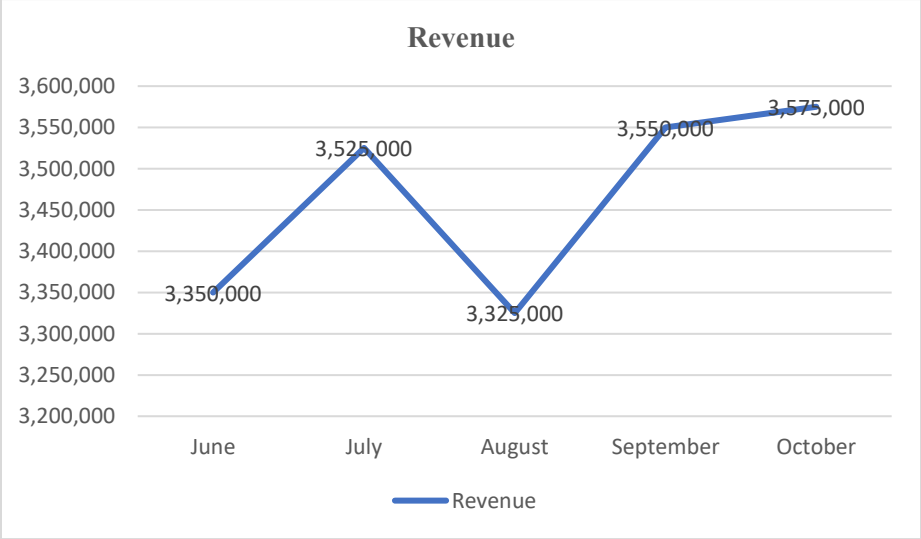

Figure 2. Increased Student Income from Guppy Sales During Student Entrepreneurship Development Program (P2MW)

Source: Data arranged by authors (2025)

Student income from guppy sales consistently increased during the P2MW program, as shown in Figure 2. This reflects the success of the hybrid marketing strategy and production efficiency. The development of 10 guppy varieties demonstrates students' research and experimentation capabilities. Guppy

farming provides a flexible and substantial income source, fostering income diversification and reducing reliance on family support.

These results align with Supartha and Sudiana (2021) on the competitiveness of guppy cultivation. However, this study emphasizes the role of students and integrates technical, managerial, and environmental sustainability skills, unlike Zuhri et al. (2021), which focused on financial viability.

Overall, P2MW has a multidimensional impact on students' entrepreneurial skills, productivity, independence, and environmental awareness.

Key Themes from Interviews

Interviews revealed four key themes:

1. Strengthening Technical Skills and Student Independence: The program improved students' technical knowledge and fostered self-reliance.
2. Flexible and Sustainable Alternative Income Sources: Income from guppy sales supports students' needs and demonstrates the program's effectiveness in creating a flexible business model (turnover increased from IDR 12.840.000 to IDR 17.325.000).
3. Digital Marketing and Networking Experience: Students successfully implemented hybrid marketing and expanded their business network.
4. Replicable Eco-Business Model: The use of used gallon waste demonstrates sustainable innovation and a replicable business model.

Discussion

This section discusses in depth how the Student Entrepreneurship Development Program (P2MW) contributes to the development of student entrepreneurship through a practical and contextual approach in guppy farming. Interviews and documentation show that the program enhances technical and managerial skills, fosters self-reliance, and encourages sustainable business model innovation. The findings confirm the importance of experiential learning in higher education and show that the synergy between institutional support and student creativity can create an adaptive and competitive community-based microenterprise ecosystem. To give a systematic description, this discussion is organized into four subsections based on the primary topics of the study findings.

Strengthening Technical Skills and Student Independence

The P2MW program provides a real-world learning environment that greatly improves students' technical abilities in guppy farming. Students obtain a thorough grasp of technical issues such as water quality management, hatchery operations, improved broodstock selection, and disease and pest control via coaching and mentorship. Mastery of these strategies boosts aquaculture output while also lowering the probability of harvest failure. This is consistent with observations by (Dahalan et al., 2020), who stress that entrepreneurship education improves students' technical talents and risk-management skills. Similarly, (Silveyra-León et al., 2023) Demonstrate that experiential entrepreneurship challenges successfully enhance students' abilities in opportunity discovery, appraisal, and resource procurement, all of which are necessary for risk management in entrepreneurial endeavors. Additionally, research conducted by (Purmono, 2023) Research on Indonesian higher education students reveals that entrepreneurial education promotes technical capabilities and risk-taking qualities, which contribute to better company success. These studies highlight the critical importance of entrepreneurship training in preparing students to negotiate and minimize risks in their entrepreneurial pursuits.

In addition to technical features, this curriculum has an influence on students' character development and independence. They are encouraged to participate actively at every stage of the business process, from production planning to post-harvest evaluation. Effectively managing the business cycle independently is evidence of growing confidence, decision-making ability, and resilience to challenges. These qualities are essential for developing robust and adaptable young entrepreneurs. This finding is supported by empirical investigations, such as (Sriwahyuni, S., & Kurjono, 2021), leadership and family company experience were found to have a favorable impact on students' self-efficacy, which in turn increased their social entrepreneurial intents. Similarly, Endarwati et al. (2021) demonstrated that integrative learning models combining cognitive and experiential learning significantly foster entrepreneurial inspiration and mindset among students. Furthermore, (Jung & Lee, 2020), it was emphasized that school experiences are critical in creating an entrepreneurial attitude, surpassing criteria like gender and major. These findings highlight the relevance of real entrepreneurial experiences in higher education for developing leadership skills and entrepreneurial autonomy in students.

Flexible and Sustainable Alternative Income Sources

One of the most visible effects of the P2MW program is the development of flexible and durable alternative revenue streams for students. The guppy fish farming firm that they created was able to earn a turnover of up to IDR 17.325.000, a 35% increase from before entering the program. This demonstrates that this firm may meet students' requirements for additional cash without sacrificing their study time.

The adaptable business model enables students to manage the firm between lecture sessions, including practicum or exam periods. The autonomous work method makes this business more inclusive and may be embraced by students from all backgrounds. This flexibility is critical in allowing students to integrate academic obligations with entrepreneurial pursuits, resulting in an extra source of revenue. Research by (Shenkoya et al., 2023) Emphasizes that non-traditional entrepreneurial activities within universities, such as simulation programs and flexible business models, have a favorable influence on the profitability of student firms. Furthermore, (Rachmawati et al., 2022) discovered that financial literacy has a substantial impact on the commercial performance of student-driven entrepreneurship, especially when students can efficiently manage their time between academic and business responsibilities. These findings highlight the significance of flexible company models in promoting student entrepreneurship and financial independence.

This accomplishment demonstrates that the P2MW program not only stimulates entrepreneurship but also helps to rebuild the student economy, which is especially important in the aftermath of the epidemic. Research by (Mehta, 2025) Demonstrates that student entrepreneurs typically struggle to balance academic commitments with company operations, resulting in stress, role conflict, and burnout. Similarly, (Jayabalan et al., 2020) Financial restrictions, a lack of expertise, and time management issues are important roadblocks for student entrepreneurs. These issues highlight the value of established support systems, like as those offered by the P2MW program, in providing students with the skills and resources they need to negotiate the intricacies of balancing both academic and entrepreneurial activities.

Digital Marketing and Networking Experience

Students effectively use digital and traditional tactics (hybrid marketing) to broaden market reach. They use social media platforms such as Instagram, Facebook, and WhatsApp Business to promote themselves, communicate with clients, and sell products directly. Students may also use marketplace platforms and online forums for ornamental fish enthusiasts to network and boost product visibility.

The capacity to establish a business network is a crucial advantage in business development. Interactions with customers, fellow business players, and P2MW program trainers provide students with fresh insights, access to national markets, and cooperation opportunities that promote company sustainability. According to Husnah et al. (2025), digital literacy and entrepreneurial skills are vital and crucial components of business education, with a substantial influence on the development of digital business skills among vocational students. Their study underlines the importance of digital and business knowledge in improving students' digital business capabilities and supporting their entrepreneurial ambitions. This emphasizes the need to incorporate digital literacy into entrepreneurship programs to provide students with the skills required for long-term business success. This event extended students' entrepreneurial views and taught them the value of strategic communication in today's competitive business environment.

Replicable Eco-Business Model

One of the most significant breakthroughs to emerge from this initiative is the deployment of an eco-business model that uses plastic jugs as growing containers. This invention has successfully reduced operational costs, increased manufacturing capacity, and supported circular economy concepts. This approach is a practical example of implementing sustainability principles on a micro scale that is relevant and useful in the campus setting.

Furthermore, the organizational structure used in student business groups is based on labor functions, such as production, marketing, and finance, which improves teamwork and responsibility. This experience provides students with practical management insights and closes the gap between classroom theory and field practice. Furthermore, establishing eco-friendly business models based on recycled materials not only improves cost efficiency but also has a good environmental impact. According to (Odeyemi et al., 2024)Green business strategies, such as circular economy approaches and sustainable innovation, help to decrease carbon footprints, boost resource efficiency, and minimize waste, so promoting long-term corporate sustainability. This illustrates how incorporating sustainability ideas into student business models may help both the economy and the environment.

This business model may be used in various agricultural sectors, such as biofloc catfish, hydroponic vegetables, or oyster mushrooms, with variations based on local resources and market features. Integrating student-led companies into campus-based incubators is critical for amplifying their effect. As noted by (Allahar, H., & Sookram, 2019), university business incubators act as vital centers in entrepreneurial ecosystems, encouraging collaboration among academics, industry, government, and civil society. Their research demonstrates that integrating student firms within these incubators not only speeds business development but also significantly contributes to regional and national economic growth by encouraging innovation and sustainable entrepreneurship.

Conclusion

This study concludes that the Student Entrepreneurship Development Program (P2MW) has successfully improved students' entrepreneurial competence in guppy farming by combining technical and managerial skills. The program generated sustainable income (average IDR 3.465.000/month) and introduced an innovative, eco-friendly business model that can be replicated. It also contributes to the development of adaptive, confident, and socially aware student entrepreneurs. The study has important implications for higher education. Practice-based programs like P2MW can be effective tools to prepare

students for real economic challenges while supporting community empowerment. The business model used in this study can be adapted for other sectors, such as catfish, hydroponics, or oyster mushroom cultivation.

However, this research has limitations. It involved only three participants, which limits generalization. The short observation period (five months) also makes it difficult to measure long-term sustainability. Future studies should include more participants, longer timeframes, and comparisons across different universities or business types to strengthen the findings.

Author's Contribution

All authors have contributed to the final manuscript. The contributions of each author are as follows, M.K.A. was responsible for the main conceptual ideas, research design, primary data acquisition and analysis (including her role as the technical person in charge of cultivation in the P2MW project under study), preparation of the main draft of the manuscript, and involved in managing the funding aspects of the research sourced from P2MW. S.A. contributed to the design of the research idea, assisted in data acquisition, data analysis, and manuscript preparation and revision. M.D.R. contributed to the acquisition of data, assisted in data analysis, and participated in the preparation and revision of the manuscript. Y.P. provided conceptual and methodological guidance, overall supervision of the study, and made critical revisions to the article to ensure quality and accuracy. All authors discussed the results of the study and contributed to the finalization of the manuscript. Funding for the implementation of the project that is the subject of this research was obtained from the Student Entrepreneurship Development Program (P2MW) as well as internal student contributions.

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Declaration of Conflicts of Interest

The authors declare that there are no competing interests or commercial/financial conflicts of interest.

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The authors would like to thank the supervisory team of the Student Entrepreneurship Development Program (P2MW) for their strategic direction, technical assistance, and guidance in developing students' skills, especially in guppy farming, as well as developing training modules and entrepreneurial management. Thanks also go to industry partners and the local ornamental fish community in Sidoarjo for supporting product marketing and providing supporting facilities.

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