A Framework for Experiential Learning: Using MOOC to Strengthen Guidance in the Food Product Innovation Project

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Abstract: *Agro-based Food Handling and Processing is a fundamental course in the Diploma in Agropreneurship (AT113), equipping students with food handling and processing and entrepreneurial skills. One of the key assessments requires students to develop a food product innovation project. However, students often struggle to fully develop and complete assessments aligned with academic and industry needs due to inconsistent guidance, time constraints, limited documentation, and a lack of student initiative. To address these challenges, this paper explores the integration of a progressive guidance and task framework of the food product innovation project into the Massive Open Online Course (MOOC) AGB296 Agro-based Food Handling and Processing course through the UFUTURE platform. The framework's structure aligns with the course topics (introduction, harvesting, post-harvest handling, food preservation, processing techniques, packaging, and branding), allowing students to apply theoretical knowledge and hands-on skills in line with Kolb's Experiential Learning Cycle. The progressive framework consists of five key stages: S1: Product Idea Development; S2: Raw Material Exploration; S3: Handling and Processing Activities; S4: Product Features, Uniqueness, and SDG Alignment; and S5: Packaging and Marketing Strategies. Each stage is supported with clear video guidelines, progress-based activities, and a*

reflective feedback mechanism that facilitates continuous interaction between students and the lecturer. The MOOC platform provides structured guidance, flexibility, and equitable access to feedback, offering a more effective and engaging alternative to traditional classroom assessment. This approach enhances the quality of student learning and innovation by mirroring real-world product development processes, thereby preparing students to contribute meaningfully to the advancement of the food industry and agropreneurial development.

Keywords: *Assessment, MOOC, effective, agro-based, innovation*

1. INTRODUCTION

Agropreneurship has gained significant attention as a key driver for enhancing agricultural productivity, sustainability, and economic viability. The agricultural and agro-based sectors are rapidly evolving, requiring future agropreneurs to acquire both technical and entrepreneurial competencies to remain competitive and adaptive (Schoneveld, 2022; Pan et al., 2024; Gadanakis, 2024). Beyond mastering agricultural practices, students must develop skills to innovate, differentiate, and communicate their product ideas effectively to meet industry and market demands (Higgins et al., 2018; Kamalrulzaman et al., 2021; Bodescu et al., 2024; Novita, 2025). In the agro-food industry, these competencies are particularly vital, as innovation involves transforming raw materials into marketable, value-added products aligned with sustainability goals. Developing such skills empowers future agropreneurs to create innovative, value-added food products, reinforce food security, support sustainable practices, and drive rural economic growth through agro-based food handling and processing initiatives.

Massive Open Online Courses (MOOCs) have emerged as a dynamic and inclusive platform for experiential learning, offering flexibility and accessibility in higher education (Wang & Zhu, 2019; Gomez-Zermeno, 2020). MOOCs promote interactive learning environments that encourage self-paced exploration, collaboration, and continuous feedback (Liyanagunawardena, 2015). These platforms have become essential for skills training due to their accessibility and scalability, particularly in underrepresented fields like agriculture. In agricultural education, MOOCs have been instrumental in

bridging the gap between theoretical understanding and practical application. Their effectiveness for applied learning depends on course design elements such as active learning activities, instructor and peer interaction, clear formative feedback, and opportunities for reflection and practice (Dinh et al., 2022; Alturkistani, 2018). The integration of project-based and reflective components into the MOOC platform fosters active learning and higher-order skill development, enhancing learners' ability to apply theory in a real-world context (Daalhuizen & Schoormans, 2018; Wang & Zhu, 2019).

The AGB296 Agro-based Food Handling and Processing course is a fundamental component of the Diploma in Agropreneurship program. This course plays an important role in bridging agricultural knowledge with agropreneurial competencies, providing students with a fundamental understanding of food handling, processing, and product innovation. The course equips students with essential technical and soft skills required in the agro-food industry (Gaspar et al., 2015). Integrating the food product innovation project into this course allows students to apply theoretical knowledge to real-world scenarios, enhancing their creativity, problem-solving, and innovation skills. Moreover, hands-on experience exposes students to market trends, consumer preferences and sustainable technologies, enabling them to create unique, competitive, and value-added agro-based food products.

However, traditional classroom approaches have focused more on theoretical instruction, leaving a gap in providing well-structured and continuous guidance for developing agro-based food products. Students often struggle to translate theoretical knowledge into practical product innovation due to time constraints, inconsistent feedback, and limited opportunities for consultation. To address these gaps, integrating an agriculture-focused MOOC provides a structured, flexible, and accessible learning platform that guides students through each stage of product development. The AGB296 Agro-food Handling and Processing MOOC exemplifies innovation by embedding instructional videos, progress-based activities, and reflective feedback mechanisms into its structure. This approach facilitates continuous monitoring, provides equitable access to feedback, and enables self-paced learning, enabling students to conceptualise, process, and commercialise agro-based food products effectively. Thus, MOOCs serve as a transformative tool in advancing practical skill acquisition and entrepreneurial readiness in agropreneruship education.

2.   PROBLEM STATEMENT

Current teaching approaches for food product innovation assignments rely heavily on theoretical instruction with traditional in-class presentation and verbal feedback. This approach restricts feedback documentation, limits students' reflection and often results in inconsistent guidance across groups. Moreover, lecturers may struggle to provide sufficient attention and feedback to all groups due to limited consultation time. At the same time, some students may show little initiative in seeking clarification or feedback from the lecturer. These constraints contribute to students' low confidence in translating theoretical knowledge into a viable food product. Furthermore, without structures and accessible guidance, certain student groups struggle to complete the assignment effectively.

To address these issues, embedding Food Product Innovation Project Progress Guidelines into the MOOC platform offers a digital solution that ensures structured, traceable, and equitable access to learning resources, guidance and feedback.

3.   FRAMEWORK DEVELOPMENT

MOOC AGB296 was first developed in 2024 and follows a course syllabus covering five main topics. The framework for the Food Product Innovation Project Progress Guidelines is organised into five progressive tasks, embedded within the five main topics of the AGB296 course (Table 1 and Figure 1). Each progress guideline consists of a lecturer-prepared instructional video (Figure 2), a structured, progress-based activity (Figure 3), a student feedback form (Figure 4), and a lecturer feedback form (Figure 5), designed to promote experiential and reflective learning. Depending on the integrated progress-based task, students are required to demonstrate their progress through in-class presentations, video submissions, or infographic posters (Figure 6). Moreover, the progress-based activity is included as one of the components during the class sessions, allowing students to engage in guided learning while receiving immediate feedback and support from peers and the lecturer. The framework also enables lecturers to provide structured and formative feedback directly

within each progress task. Feedback is provided through a digital rubric for grading and documentation, and through a discussion forum linked to each task for formative dialogue. The structured approach ensures clarity, consistency and continuity across all learning stages. The framework designation supports Kolb's Experiential Learning Cycle, which emphasises learning as a continuous process involving experience, reflection, conceptualisation, and experimentation (Figure 7). The framework's continuous cycle encourages continuous learning and innovation, bridging classroom learning with real-world agropreneurship practice.

Course Topics	Integrated Progress Guidelines	Objective
1. Introduction to Agro-based Food Handling and Processing	Stage 1 (S1): Idea Product Proposal	To guide students in identifying problem statements using the 5W1H (What, Who, When, Where, Why, and How) concepts and propose ideas according to the given theme.
2. Agro-based Harvesting	Stage 2 (S2): Raw Material Selection	To guide students in analysing the main raw material function, health benefits, limitations in handling and processing, and sustainability.
3. Post-harvest Handling	Stage 3 (S3): Handling and Processing	To guide students in describing the processing flow, safety and processing method.
4. Food Preservation and Processing	Stage 4 (S4): Product Features, Value/ Benefits, Uniqueness and SDG Alignment	To guide students in identifying features, benefits, uniqueness and SDG contribution.
5. Packaging, Storage & Branding	Stage 5 (S5): Packaging, Branding, 4Ps and Commercialisation Potential	To guide students in selecting suitable packaging, justify the choice, outline the brand and logo story, 4Ps engagement and commercialisation potential.
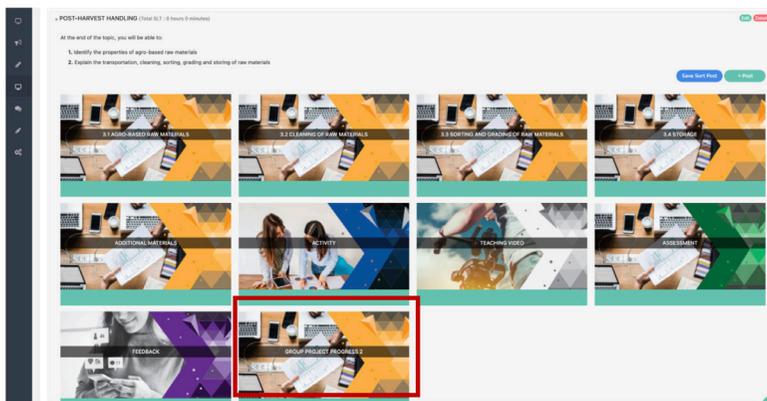
Figure 1. The Food Product Innovation Project Progress Guidelines are embedded into the main topics of the AGB296 course on MOOC.

Figure 2. An original instructional video by the author on food product innovation project guidelines via MOOC.

Figure 3. Example of embedded progress-based activity for the Food Product Innovation Project Progress.

Figure 4. A Google Form to collect students' feedback on the progress guidelines.

Figure 5. Lecturer feedback feature within the MOOC-integrated framework for the Food Product Innovation Progress.

The integrated progress guidelines framework promotes experiential learning in the AGB296 Agro-based Food Handling and Processing course by ensuring learning occurs through doing, reflecting, and improving. Each progress stage is supported by structured video guidelines, progress-based activities, and a feedback mechanism that allows students to apply theoretical concepts through guided, hands-on learning. Moreover, these components aim to guide students systematically through the stages of food product development while encouraging continuous improvement. Progress-based activities are embedded in the course lesson plan throughout the semester, helping students clearly understand the timeline and expectations for each stage of product development. With a structured schedule, students can plan, prepare, and complete their project milestones, meeting the submission date. Furthermore, the use of digital tools, particularly infographic posters and video presentations, promotes students' creativity and communication competencies by encouraging the articulation of ideas and project outcomes through visually engaging and innovative formats. The dual feedback system, which delivers lecturers' feedback on students' progress, allows continuous monitoring of student progress, ensures transparency and accessibility, and enables students to revisit feedback at their own pace and align improvements with subsequent tasks.

Through the MOOC platform, students will have the flexibility to learn at their own pace. At the same time, the lecturer can systematically monitor progress, provide continuous feedback, and ensure equitable access to guidance across all groups. The framework can promote creativity, problem-solving, and innovation in students by simulating real-world food product development processes aligned with industry practices. These also foster entrepreneurial skills and agropreneurial competencies, aligning with national goals to develop agropreneurs who can transform local produce into innovative commercial products and support sustainability. Overall, the framework provides a structured, transparent, and flexible mechanism to strengthen the quality of student guidance, reflection, and innovation in the agro-based food course. The MOOC platform may serve as an experiential learning tool for agropreneurship education. Future implementation will focus on evaluating its effectiveness in guiding, improving the quality of food product innovation, and enhancing students' learning experience.
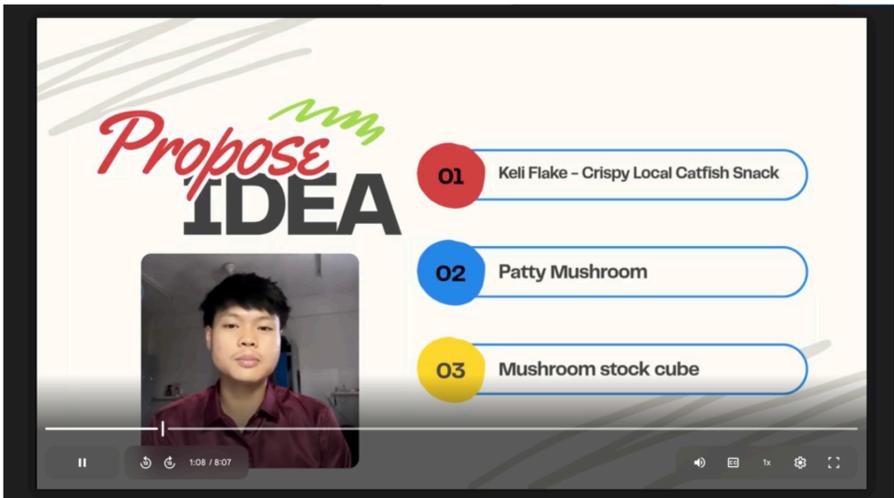
Figure 6. Example of a task completed and presented in video form by students for the Food Product Innovation Project Progress.
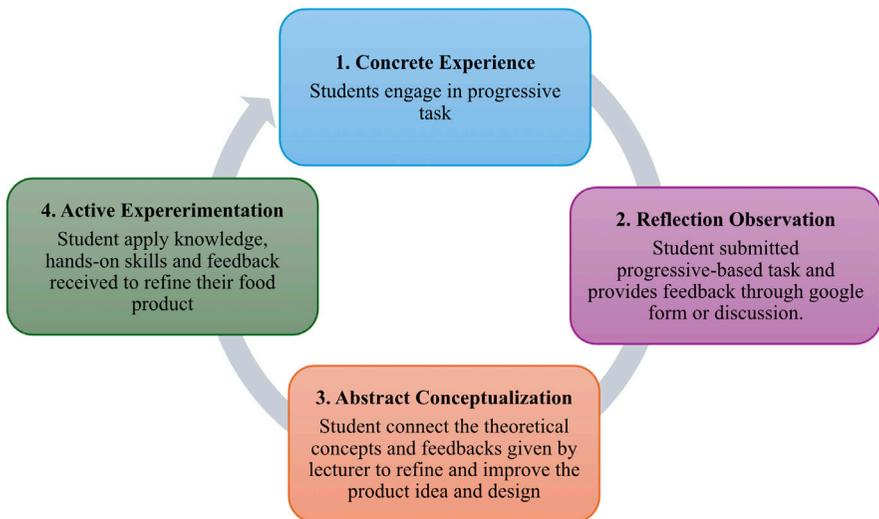

Figure 7. Aligning the framework design with Kolb's Experiential Learning Cycle.

4.   CONCLUSION

This paper presents a framework for integrating Food Product Innovation Project Guidelines into the MOOC platform to support experiential learning in agro-based food innovation. The approach offers a practical solution to enhance structured guidance to students, reflective and continuous learning, and industry alignment. The guidelines not only help students complete their project assignments but also empower them to develop innovative, sustainable, and marketable food products while promoting independent learning. Future work will include implementing and evaluating the framework in real-world settings. Adopting this model in other vocational or entrepreneurial programs is recommended to support innovation-driven learning through digital platforms.

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The framework was conceptualised by Sinong, G. F., who led its development. The initial draft of the manuscript was written by Sinong, G. F., who contributed to subsequent revisions, critically reviewed the content, and approved the final manuscript for submission.

8.   CONFLICTS OF INTEREST DECLARATION

I certify that the article is the authors' original work. The article has not received prior publication and is not under consideration for publication elsewhere. This manuscript has not been submitted for publication, nor has it been published in whole or in part elsewhere. I testify that the author has contributed significantly to the work submitted to IJELHE.

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