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Enhancing the Student Entrepreneurship Education Model Using Design Thinking and Lean Canvas Approaches

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Abstract

The aim of this study was to develop a student entrepreneurship education model that integrates the design thinking model into the creative problem-solving process and finds solutions to problems through Lean Canvas. The solutions generated can be translated into a unique value proposition substantiated by ownership of a competitive advantage that is difficult to be imitated by competitors. According to the Lean Canvas model, merely being a pioneer in a new market cannot be perceived as a competition. Further activities for developing entrepreneurial competencies include expanding knowledge, changing the existing mindset, motivating, skills, and the ability to develop businesses through training and mentoring in entrepreneurship, and national virtual entrepreneurship competitions. Study participants were recruited from the University of Mulawarman, including heads of faculty (n=2), study program coordinators (n=3), lecturers teaching entrepreneurship subjects (n=4), and students (n=76). Data were collected and analyzed using observation, interview, and documentation techniques. The effectiveness of entrepreneurship education based on design thinking and Lean Canvas methodologies was also explored. A successful implementation of these methodologies required integration and synergy between entrepreneurship activities and leveraging the entrepreneurship ecosystem collaboration model. This included a range of activities such as lectures, training, coaching, and business plan competitions. Lectures were designed to foster entrepreneurial development based on the local region and strengthen collaborations among associations, businesses, communities, governments, and media ecosystems. The entrepreneurship education program introduced entrepreneurial thinking patterns and business planning through design thinking. Business coaching was used to cultivate advanced entrepreneurship competencies and guide business development. The Lean Canvas method largely focused on validating the compatibility between the problem, the solution, and the market.

Keywords: *ABCGM, business coaching, design thinking, entrepreneurship education, lean canvas*

Introduction

According to the 2018 Global Entrepreneurship Index (GEI) data, Indonesia experienced a significant decrease in its GEI score compared to the previous year. GEI score evaluation is based

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on 14 pillars grouped into three sub-indexes: entrepreneurial attitude, entrepreneurial ability, and entrepreneurial idea. Indonesia's scores were particularly low in pillars such as capturing opportunities, starting ability, product innovation, and process innovation. Compared with other ASEAN countries, Indonesia ranked 94th and was behind Singapore, Malaysia, Thailand, Philippines, and Vietnam (Ács et al., 2018).

To improve the quality of human resources and boost productivity, the Indonesian government has adopted relevant measures to promote entrepreneurship education. The National Education System Law No. 20 of 2003 aims to prepare individuals to be creative, innovative, and productive, contributing to societal, national, and global civilization. Entrepreneurship education programs are intended to equip students with an in-depth understanding of entrepreneurial concepts, mindset, and behavior, hands-on experience, and the ability to capitalize on opportunities. However, the success of these programs is impeded by a number of obstacles, such as universities not being prepared to implement them, underutilizing local potential, and focusing too much on products.

The decline in Indonesia's GEI score underscores the pressing need for a comprehensive approach to promote entrepreneurship and develop the necessary skills and mindset for entrepreneurs. The government's efforts to incorporate entrepreneurship education in the national curriculum are a step in the right direction. However, universities and the private sector must collaborate to provide students with practical entrepreneurial experience and support to help them realize their full potential. If successful, these efforts can help Indonesia create a thriving entrepreneurial ecosystem and improve its ranking in the GEI index.

Entrepreneurship is a field of study that explores an individual's values, skills, and behaviors in coping with life's challenges and identifying opportunities while managing concomitant risk factors. As a discipline, entrepreneurship involves a systematic and disciplined process of applying creativity and innovation in accordance with market needs and opportunities. This definition of entrepreneurship includes two important aspects of entrepreneurship education: first, the ability to identify market needs and opportunities, and second, the capability to develop creativity and innovation to meet these market needs and opportunities.

Entrepreneurship education is an integral aspect of building a sustainable economy and society. It is a process that involves providing individuals with the requisite knowledge and skills that would help them identify opportunities that others may overlook. According to Handrimurtjahjo (2013), entrepreneurship education aims to equip students with the insight, self-confidence, and expertise

to act on their ideas and take risks that ultimately lead to success. Fayolle (2009) further elaborated on entrepreneurship education by defining it as activities that support the entrepreneurial process. This process begins with developing entrepreneurial mindset, attitude, and skills to generate innovative business ideas that can contribute to economic growth and development. In other words, entrepreneurship education helps individuals acquire the essential skills and knowledge to build, launch, and grow successful businesses.

Entrepreneurship education encompasses the content, methods, and activities aimed at developing the necessary motivation, competence, and experience that participants require to manage and participate in the process of value creation (Rasmussen et al., 2015). In essence, entrepreneurship education is designed to equip individuals with the mindset, attitude, knowledge, skills, and experience necessary to recognize and capitalize on opportunities, start and grow businesses, and create value for themselves and others. Entrepreneurship education involves a wide range of content, methods, and activities that are intended to cultivate the entrepreneurial spirit within individuals. It aims to develop the skills and knowledge necessary for creating innovative business ideas and implementing them successfully. This education helps individuals to develop the entrepreneurial mindset and attitude required to take risks, persist through challenges, and recognize and capitalize on opportunities. Ultimately, entrepreneurship education aims to develop individuals who are capable of creating and managing successful businesses that contribute to economic growth and social progress.

Handrimurtjahjo (2013) noted that in certain higher education institutions, entrepreneurship education is implemented in four stages: a creativity program in the first year, a foundation program in the second year, an establishing entrepreneurship program in the third year, and a hatchery program in the fourth year. The first two years of the program are designed for all students in management or business administration programs. On the other hand, the third and fourth years are targeted at selected students with high entrepreneurial character and motivation to establish new start-ups. By providing a structured program that gradually builds entrepreneurial knowledge and skills, students can develop the necessary mindset, knowledge, and expertise required to start and grow successful businesses. The selective nature of the third and fourth years also helps ensure that only the most committed and motivated students pursue the entrepreneurship program, increasing the likelihood of their success in the field. Entrepreneurship education in higher

education institutions can be tailored to meet local market needs and opportunities while providing a structured program that gradually builds entrepreneurial capacity among students.

Kodrat and Christina (2015) pointed out the process of creating entrepreneurs through education in the Faculty of Economics at Universitas Ciputra. The entrepreneurship education process is implemented in two stages, namely: 1) awakening students' inspiration to cultivate a mindset during the first semester; and (2) building the ability to see opportunities, creativity, and calculating risks, leadership skills, and developing a students' business network, which is done during the first to the seventh semester. Training and/or developing creativity can be accomplished through 4P, which stands for: 1) creative personal formation, 2) motivational driver of creativity, 3) creativity process, and 4) creative product. Gasse and Tremblay (2006) remarked that promoting entrepreneurship and enhancing the use of creative capacities that have become part of the Canadian University environment can be accomplished through actions such as developing a positive attitude toward entrepreneurship, expressing university program and media agreement, presenting entrepreneurship as a lifestyle, promoting entrepreneurial success through social recognition and honor, strengthening talents, monitoring exits for opportunities, and including discovery, invention, and risk-taking in pedagogical content.

According to Suryana (2013), creativity entails the ability to develop new ideas and approaches for problem-solving and discovering opportunities. Innovation, on the other hand, refers to the ability to apply creativity to solve problems and find opportunities. Entrepreneurs can create something new and different, such as processes, methods, goods, and services, which adds value and provides an advantage. Regional universities can identify market needs and opportunities by understanding the needs of buyers in the local area. Creativity and innovation in such universities can take the form of improving existing products, packaging, or creating new products that are not yet available in the area or borrowed from other regions. This approach to entrepreneurship in regional universities focuses on developing solutions that cater to local demands and opportunities. By fostering creativity and innovation among students, regional universities can develop entrepreneurs capable of identifying local market needs and opportunities and devising innovative solutions that satisfy those needs. This approach to entrepreneurship education can help build a sustainable local economy and contribute to social progress.

Advantage is competitiveness, and competitiveness is the opportunity for success. With creativity, entrepreneurs can see something old and think of something new and different. Thus, the true

secret of entrepreneurship lies in creativity and innovation to create something new and different. Entrepreneurial success is achieved when someone thinks creatively and innovatively to create something new or reform something old.

However, novelty alone is not enough to define a creative product. For a product, including goods or services, to be deemed "creative," it must also be able to solve a problem or meet a need and aesthetically integrate different elements through continuous improvement (Riyanti, 2019). Thus, in the development of a creative product, or what is also called "innovation," understanding the problems of potential consumers is paramount. This is seen in the problem-solving approaches that are based on Alex Osborn's technique, such as the CPS version 6.1 (Treffinger & Issaksen, 2005) and the application of design principles in the development of new products as known as the design thinking model (Kimbell, 2009).

Design thinking has demonstrated compatibility with other modern approaches to innovation and entrepreneurial development, including the lean startup methodology (Lewrick et al., 2018; Mueller & Thoring, 2012), the design sprint (Knapp, Zeratsky, & Kowitz, 2016), and business model tools such as the Business Model Canvas (Osterwalder & Pigneur, 2010) and Lean Canvas (Maurya & Mishra, 2012). The broad adoption of the design thinking model can be partly ascribed to its adaptability and ease of integration with other methodologies.

Academic articles on entrepreneurship education only present general concepts of entrepreneurship education but have not yet revealed its educational design model. The same holds true for articles on design thinking and Lean Canvas, which are somewhat unfamiliar in Indonesia. This study attempted to design an entrepreneurship education model based on design thinking and Lean Canvas.

The primary aim of this study was to create an effective entrepreneurial education program that fosters students' entrepreneurial competencies at various levels (beginner, intermediate, and advanced) by integrating and synergizing academic-based creative knowledge and skills with entrepreneurship courses. The program focuses on strengthening collaboration between penta-helix stakeholders (academia, business sector, community, government, and media) through the 3C phases of connect, collaborate, and commerce. The study also sought to establish a supportive Student Entrepreneurship Association at the faculty level and evaluate the comprehensive outcomes of the program, including the preparation, implementation, outputs, and achievement of targets. Altogether, the study aimed to promote a successful entrepreneurial education ecosystem

that encourages collaboration and student– industry partnerships, leading to the sale of products and the growth of student-run businesses.

Literature Review

The Development of Entrepreneurship Education based on the Design Thinking Model

The design thinking model is a design-based approach methodology that presents a solution-oriented approach to problem-solving (Leavy, 2010). The design thinking process is more effective when carried out in a group with a diversity of disciplines and high-thinking tendencies, resulting in a comprehensive understanding. It is worth noting that customer needs are a common criterion to serve as a starting point in the development of solutions, as indicated in the design scope. The process of identifying customer preferences is the first step in which customer understanding is obtained. Next, the perspective used in problem-solving and the limitations of the problem are formulated clearly. Finally, the process of collecting ideas using brainstorming is carried out to develop various alternative perspectives.

To see how these potential ideas or solutions are implemented, making prototypes and testing them plays a crucial role in the continuous improvement process (Razzouk & Shute, 2012). One form of testing solutions is to ask potential customers to complete a task using the prototype in a real-world environment to identify the various difficulties they may encounter. The results of the testing are then used as the basis for deciding what improvements need to be made. If the gap found is significant and more insights are needed to close it, the design thinking process allows us to repeat the steps undertaken. Which stage to repeat depends on the size and type of gap found.

The users' desire to understand their needs and identify problems as well as to determine what has value for them is illustrated in Figure 1 of the entrepreneurial ecosystem collaboration model. Users aim to find solutions or market fit through validation processes to uncover sustainable and growing business opportunities. Users also seek to identify problems or solutions through validation processes by measuring their technological resources. Validation processes require matching tools such as design thinking and lean business models. Business opportunities and technological feasibility are required and aligned with the entrepreneurial ecosystem collaboration model (Sumarno et al., 2018).

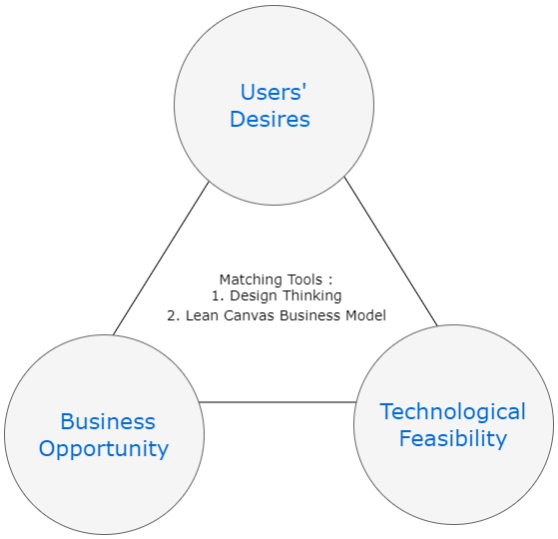

Figure 1. Entrepreneurial Ecosystem Collaboration Model

At every stage, the development of creative products or any innovations always originates from understanding and defining customer or user problems. Even these approaches are triggered as a result of the emergence of problems that are not well defined or are extremely complex. It can be concluded that solving problems creatively, including design thinking, is present to answer the needs of entrepreneurs who usually operate in uncertain conditions with minimal guidelines (Ries, 2011). As one of the creative problem-solving approaches, design thinking seems to have attracted the attention of academics and practitioners since 2007. This is evidenced by the surge in the number of scientific publications, with a total of 23 book-form, journal articles, and other written works that examine or use this approach in the span of one year (Johansson- Sköldberg et al, 2013). The popularity of design thinking, also referred to as user-centered design by some experts, is supported by the success of IDEO, one of the most influential design companies in the world, in developing new products and innovative solutions to tackle social problems (Brown et al., 2019). This shows that design thinking is flexible enough to be used in solving a wide range of problems. Under the guidance of IDEO, studies also indicate that design thinking has been widely used in solving educational problems.

The design thinking process is iterative and flexible and focuses on collaboration between the user and the producer of the product or service (Liedtka, 2018). Its prime emphasis is on how ideas are generated based on the thinking, feeling, and behavior of the consumer. The implementation steps

begin with the attraction of empathy, followed by defining the problem, summarizing ideas, creating prototypes, and testing.

The initial step in design thinking is to gain an empathetic understanding of the problem at hand. This process involves observing, asking questions, and experiencing the customer or subject's experience. Empathy is critical in this process as it allows the planner to make assumptions based on the user/customer's needs. In this stage, information is gathered to form the basis for the next stage to produce a comprehensive understanding of the user/customer's needs and problems.

In the define stage, the information obtained in the empathize stage is analyzed according to the observation to identify the main problem faced by the user or customer (Barsalou, 2017). For example, writing a problem statement in the define stage is from the user's perspective. For example, young women require nutritious food for growth. It will be different if defined from the company's perspective such as: it is necessary to increase the sale of healthy food to young women by 5%. In this stage, the planning team will find ideas that are solutions to the problems faced by customers or users. At this point, the ideation stage has already begun by asking the main questions to find solutions to problems such as: how to motivate young women to do something that will benefit both young women and the healthy food provider company?

In the stage of synthesizing ideas, the planner has begun to generate concepts centered on consumer or user needs (Luka, 2020). The main guide for the planner is to start thinking creatively to identify new solutions to address the problems previously identified and to employ new alternative perspectives to look at the problem. Techniques that can be used in collecting ideas include brainstorming, writing down opinions, and worst-case scenario forecasting. Brainstorming and worst-case scenario forecasting are often used to stimulate free-thinking and broaden the understanding of the problem. It is crucial to identify as many solutions as possible in the early stages of ideation, followed by selecting one or several ideas to undergo testing to determine the best solution that satisfies the consumer's needs.

After synthesizing ideas, the next stage is to create prototypes. Creating prototypes from ideas is a way to test the product or service that will be sold. Prototypes can be tested with people outside of the planning team (Dam & Siang, 2020). This stage is an experimental phase with the goal of finding the best solution for each problem that has been identified. Testing can be in the form of product use or behavioral testing in service sales. This is an iterative process wherein testing results

are frequently used to redefined the problem to once again discover what the user or consumer needs, how they will use it, and how they think, feel, and behave.

The Creative Entrepreneurship Approach based on the Lean Canvas Business Model

In creating new entrepreneurs, besides the skills necessary to effectively solve problems, a framework is needed to describe how a business can create and capture value. Business models offer a convenient tool for new entrepreneurs to develop and test new business concepts (Geissdoerfer et al., 2018). From this perspective, a business model can be viewed as a prototype of a yet-to-exist or undeveloped business. During the early stages of developing a new business, the business model is often filled with assumptions or hypotheses that are yet to be proven and are a part of the new entrepreneurs' mental model. New entrepreneurs are tasked with gradually identifying and testing the validity of these hypotheses in their business model.

The two most popular business models or tools used in the development of new businesses are the Business Model Canvas and the Lean Canvas. Both of these models have similarities, and each has its own strengths. The Business Model Canvas, designed by Alexander Osterwalder, is able to provide a more comprehensive description of how a business operates. Essentially, the Business Model Canvas consists of nine building blocks that can be grouped into four main categories: value proposition, customer interfaces, company infrastructure, and financial aspects (Link, 2016). Thus, it is well suited to be used as an operationalization method for strategy, as the relationship between the nine building blocks of the Business Model Canvas provides a clear and holistic view of the key elements that are essential for the success of a business.

An adaptation of the Business Model Canvas that is widely used in developing new businesses is the Lean Canvas, developed by Ash Maurya (Maurya, 2022). The latter emphasizes the importance of creating a business model based on creatively solving customer problems. The solution must be translated into a unique value proposition substantiated by a competitive advantage that is difficult to be imitated by competitors. In Lean Canvas, simply being a pioneer in a new market is not considered a competitive advantage. However, competitors can be gradually built and do not always have to be owned from the start of a new business development. Lean Canvas also places a strong emphasis on validation of the compatibility between the problem and the solution as well as the compatibility between the problem and the market. Lean Canvas itself was adapted by Ash Maurya from the BMC created by Alexander Osterwalder (Maurya, 2022).

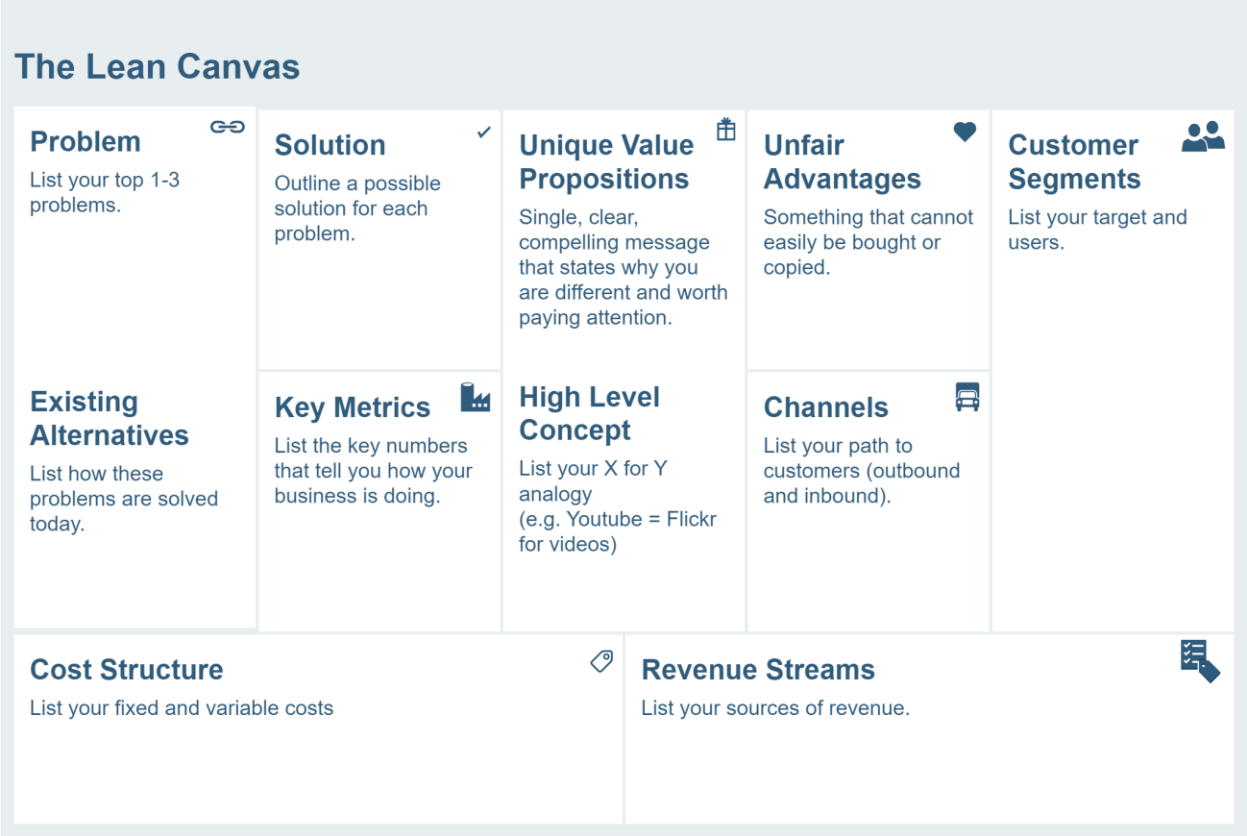

Figure 2. Lean Canvas (Source: Maurya, 2022)

The results of prototypes that have undergone testing in the design thinking model are incorporated into the Lean Canvas business model. The problems that have been solved through design thinking are re-mapped through the Lean Canvas. The first step in this process is to describe the problem experienced by the user or consumer that needs to be solved. In design thinking, this is the empathy stage, where students learn to empathize and experience the problems faced by the user or consumer. Without any user or consumer problems, there will be no product or service to offer.

The next step is to determine the problem and the target market, which are interrelated. Without specifying the target market, it is not possible to map the problems that will be solved through the product or service offered. This determination of the target market is very important because the business cannot serve all consumers or buyers in the market. There are too many buyers with very diverse needs and wants, so it is necessary to identify which part of the market will be the main target.

In the middle of the canvas is the unique value offered to the customer. What the customer expects so that he/she is willing to buy the product or service. Unique value is essentially a message that states that the product or service that has been designed and tested is worth buying.

Finding a solution to the problem is the key to the Lean Canvas. Conducting surveys of the solutions offered to the customer segment is one way to validate the idea. The cycle in the lean model is the build, measure, and learn cycle, similar to the testing process in design thinking.

Channels or media are a way to reach customers through media. The selection of media can be done through digital technology and informatics. This is the main way to reach customers. These channels can also act as a brand communication tool. Thus, these channels can be described as a business modelling mechanism or a mode for a company to communicate and provide value proposition to its customer segment.

Return or revenue is a crucial part of the Lean Canvas model. The price of a product or service depends on the type of model. Implementing a pricing strategy for a product or service is more recommended in this model. The revenue component includes the money generated by the company for each customer segment previously identified. However, this does not mean profit but rather the revenue stream involved. This is because the core of the business model is the customer. Financial structure needs to be planned in all activities, including entrepreneurial activities. Entrepreneurs must make a list of operational costs for their business to reach the expected Break-Even Point. It includes mapping costs to operate the business according to the value proposition.

A key matrix is used to monitor business performance and can use Dave McClure's pirate metrics model. Key metrics are the steps a customer must take when using a product. The steps provided must be more efficient than the problems in the first segment.

The worst-case scenario is essentially finding something that cannot be imitated or bought. It can be in the form of information, the desires of the team, expert reinforcement, and owned customers. An unfair advantage refers to an advantage possessed by the product or service created. The advantage possessed cannot be imitated. This advantage can also be achieved by working with other institutions.

Method

Research Design

This study employed a qualitative descriptive approach aimed at investigating the current state of entrepreneurship education activities at the University of Mulawarman. The primary goal was to understand the existing structure and processes, and then propose a revised model to enhance student entrepreneurship competencies. To achieve this, we utilized a multi-method approach including non-participant observations, semi-structured interviews, and documentation review. The design was selected due to its capacity to deeply explore and describe the real-world context of entrepreneurship education at the university. This approach allowed us to develop a revised, more effective model for entrepreneurship education, integrating Design Thinking and Lean Canvas approaches, which are known for fostering a user-centered and innovative mindset and efficiently outlining business concepts.

Participants

The study group comprised 85 participants, purposely chosen for their direct involvement in entrepreneurship education at the University of Mulawarman. This group encompassed heads of faculty (n=2), study program coordinators (n=3), lecturers teaching entrepreneurship subjects (n=4), and students (n=76) in their 4th or 6th semester, each offering unique perspectives on entrepreneurship education. This purposeful selection allowed us to gather rich, diverse insights into the current state and impact of entrepreneurship education at the university, ultimately enabling a comprehensive understanding of the subject matter.

Data Collection Tools

Our research employed three primary data collection tools. Non-participant observations provided firsthand, real-time data on the implementation of lectures and supportive entrepreneurship activities. Semi-structured interviews, offering flexibility and adaptability, provided in-depth data on participants' experiences and perspectives. We ensured their validity and reliability through careful design and execution, and consistent application of the interview protocol. Finally, we reviewed documentation, including reports and other relevant documents, as a complementary method, allowing us to verify and enhance the data obtained from observations and interviews.

Data Collection

Data collection occurred from February to October 2021. We began with non-participant observations of lectures and entrepreneurship-related activities, with detailed field notes taken throughout. Following this, we conducted semi-structured interviews focusing on participants' experiences and perspectives on entrepreneurship education and activities at the university. Lastly, we reviewed documents related to entrepreneurship activities, adding another dimension to our data pool.

Data Analysis

Our data analysis employed qualitative descriptive analysis techniques. We started by reviewing all collected data, including observation notes, interview transcripts, and documents. Open coding was conducted to assign codes to relevant data segments, which were then organized into broader categories and themes. We employed constant comparison and memo-writing techniques throughout the analysis to ensure the consistency and validity of the identified themes. This comprehensive analysis allowed us to distill the data into meaningful findings, leading to an enhanced model for entrepreneurship education.

Findings

Entrepreneurial Education Activities and Methods

As stated above, during data analysis, a process of open coding was carried out, in which relevant data segments were assigned codes based on their content. These codes were then organized into broader categories and themes, which structured the findings. The findings were categorized into three educational activities, namely, beginner, intermediate, and advanced entrepreneurial education activities, and injected with the design thinking model and Lean Canvas. The data were collected over 10 months using non-participant observations, semi-structured interviews, and documentation review. These methods allowed researchers to gather information on lecture implementation, supportive entrepreneurship activities, and the results of entrepreneurship education activities.

To achieve the optimal entrepreneurial education goal, the entrepreneurial development process is based on the region and strengthening collaboration between the association, business, community, government, and media (ABCGM) ecosystem. Furthermore, the entrepreneurship program

education introduces entrepreneurial thinking patterns and business planning. The entrepreneurship development process is based on strengthening the potential of the surrounding environment and requires collaboration between entrepreneurship ecosystem stakeholders, also known as penta-helix stakeholders' academia, business sector, community, government, and media (ABCGM) + 3C phases of connect, collaborate, and commerce, as depicted in Figure 3. From the relationships established, the next step is a joint venture between students and the ABCGM ecosystem elements. Finally, as the final step, students make efforts to promote the sales of the results of collaboration between students and the ABCGM elements.

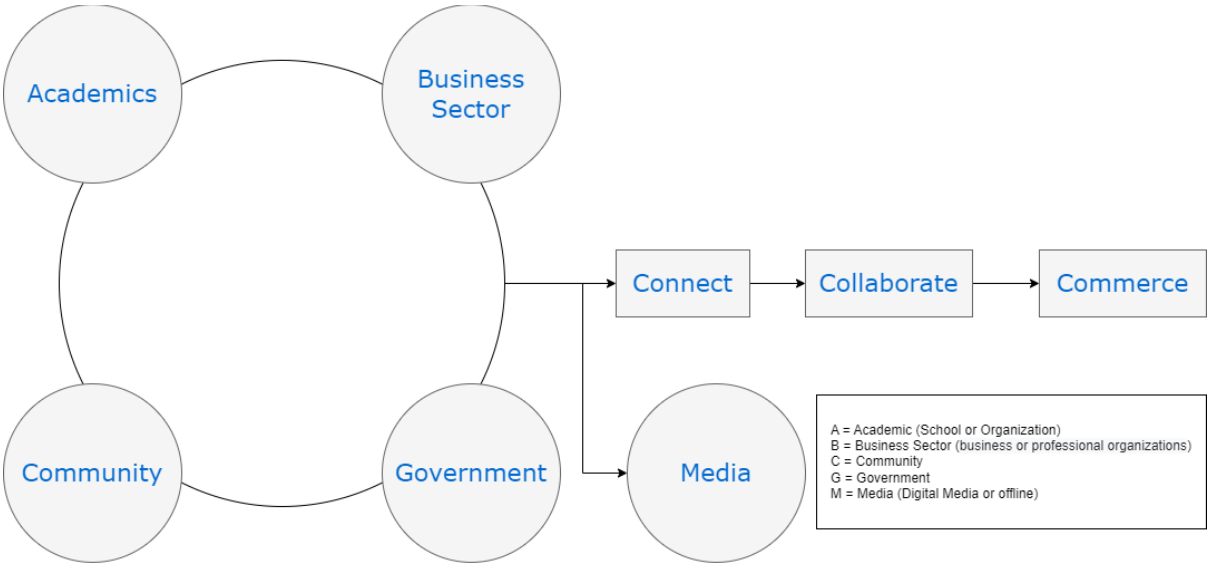

Figure 3. Penta-Helix stakeholders' academia, business sector, community, government, and media (ABCGM) + 3C phases of connect, collaborate, and commerce.

Entrepreneurial education activities and methods for cultivating beginner entrepreneurship competence, such as planting awareness, mindset, motivation, knowledge, skills, and beginner entrepreneurship practices, consist of lectures conducted at the department level (Monge-Agüero et al., 2022). Lectures are conducted conceptually and apply practical methods that include both theoretical and practical lectures through design thinking approaches. Practical activities can be carried out both on- and off-campus.

Entrepreneurial education activities and methods for cultivating beginner entrepreneurship competencies, such as awareness, mindset, motivation, knowledge, skills, and entrepreneurship

practices, consist of lectures conducted at the departmental level. Lectures are integrated with design thinking methods, which help students develop a user-centered and innovative mindset. The five stages of design thinking (empathize, define, ideate, prototype, and test) are incorporated into the curriculum to teach students how to identify problems, generate creative solutions, and iterate their ideas.

Practical activities are carried out both on- and off-campus and include the application of the Lean Canvas approach. The Lean Canvas model is a simplified version of a business plan that focuses on nine essential components, which enables students to efficiently outline their business concepts, identify risks and assumptions, and develop a data-driven and customer-oriented approach to entrepreneurship. By combining design thinking and Lean Canvas approaches, the revised entrepreneurial education model offers a more comprehensive and practical framework for students to develop and refine their entrepreneurial skills, paving the way for successful ventures in the future.

Entrepreneurship lectures integrate and synergize the content of entrepreneurship courses and the content of department courses to develop students' academic-based creative knowledge and skills and entrepreneurial experience practices. Integration and synergy are carried out both in theoretical and practical lectures. This aligns with the findings of Aldianto et al. (2018), who stated that entrepreneurship development programs are anticipated to become a means of integrating the mastery of science and technology with the spirit of entrepreneurship.

Lectures are comprehensively evaluated, including their preparation, implementation, outputs, and achievement of targets. The preparation is evaluated through the course materials that include syllabi, course contracts, semester course plans, and assessment instruments. The implementation of the lectures is evaluated by supervising lecture delivery. The outputs of the lecture are evaluated based on the business plan proposal produced by the students. The achievement of the lecture's targets is integrated and synergized with the Student Creativity Program in the field of Entrepreneurship (PKM-K) or the Merdeka Campus Free Learning Entrepreneurship Program. The achievement of the lecture's targets is evaluated through the businesses run and developed by the students or graduates. The achievement of targets is integrated and synergized with the Indonesian Student Business Competition (KBMI) or the Merdeka Campus Free Learning Entrepreneurship Program. The government, through the Directorate of Learning and Student Affairs, regularly holds competitions such as PKM-K and KBMI.

At the program level, beginner-level entrepreneurship education activities can take the form of a creative program event. The results of such activities are integrated and synergized with the student organizations in the entrepreneurship field at the program level. This integration and synergy at this level form the Student Entrepreneurship Association or community at the faculty level. This association or community accommodates students who run PKM-K and KBMI along with other independent entrepreneurship education activities.

Activities to cultivate intermediate entrepreneurship competencies include expanding awareness, thinking patterns, motivation, knowledge, skills, and the ability to establish or start a business, such as training, competitions, and entrepreneurship mentoring. These activities are carried out by the faculty or the university's entrepreneurship unit or the synergy between them. The faculty or the university's entrepreneurship unit can cooperate with entrepreneurship practitioners at the regional level. Students begin to involve themselves with the elements of the ABCGM ecosystem. The training is carried out in the form of workshops that emphasize practical or demonstration of entrepreneurial knowledge and technical skills through the Lean Canvas business model approach. Educational activities can be carried out both on- and off-campus. Entrepreneurship competitions are held to cultivate entrepreneurship competencies at the faculty level, with representatives from each program participating. Mentoring is carried out in the form of guidance and/or technical entrepreneurship consultancy from practitioners in accordance with the needs of the students, both before and after the Virtual Entrepreneurial Competition, which can be evaluated by regional level entrepreneurship practitioners.

Training and mentoring integrate and synergize the training content with the academic knowledge of the program to develop creative education activities and practical entrepreneurial experiences for students based on their academic knowledge. Integration and synergy are carried out in both the creative process and practical experience. The training and mentoring are comprehensively evaluated, including the preparation, implementation, outputs, and achievement of the targets. The preparation is evaluated through the content, the trainers, and the assessment tools. The training and mentoring process is evaluated through monitoring the implementation of the training and mentoring. The outcomes of the said training and mentoring are evaluated from the business plan proposals produced by students for the KBMI program or for other business plan competitions at the regional level or from the results of pre- and post-training or mentoring tests.

Entrepreneurship competitions are held to consolidate and evaluate the results of the training and mentoring process. The results of the regional entrepreneurship competition or the development of medium entrepreneurship competencies at the faculty level are integrated and synergized with the entrepreneurship student organizations at the faculty level. This integration and synergy at this level form the Student Entrepreneurship Association or Community of the Faculty. This association or community accommodates students who carry out KBMI and other entrepreneurial education activities.

Further activities for the advanced entrepreneurship competencies include expanding knowledge, changing the existing mindset, motivating, improving skills, and the ability to develop businesses through training and mentoring in entrepreneurship and national virtual entrepreneurship competitions. These activities are managed and carried out by the university's entrepreneurship unit. Training is conducted in the form of workshops that focus on practical or demonstration-based knowledge and technical entrepreneurial skills for business development. The training or mentoring practice involves the participant's business. Mentoring, on the other hand, is carried out in the form of guidance and/or technical entrepreneurial consultation as needed by the participants and/or the initiative of the mentor. Business incubation is carried out in the form of facilitation by the university's entrepreneurship unit, covering business location, management, production, marketing, or funding. National or international entrepreneurship competitions are held in the form of a Virtual Entrepreneurial Competition for managing and developing businesses, including products, production processes, markets and marketing, or organizational business management.

Training, coaching, incubation, and Virtual Entrepreneurial Competition must integrate and synergize their content with the academic disciplines of the program or department to develop students' entrepreneurial endeavors and practical experiences based on their academic disciplines. Integration and synergy are carried out in the training, coaching, and incubation processes. Efforts should be made to encourage the sale of products resulting from student–industry collaborations.

Comprehensive evaluations are conducted for the preparation, implementation, outcomes, and achievement of the training, coaching, and incubation programs. The preparation is evaluated through its content, speakers, evaluation instruments, and available incubation facilities. The training, coaching, and incubation processes are evaluated by monitoring the implementation of the training, coaching, and incubation programs. The outcomes of the training, coaching, and incubation programs are evaluated based on the students' business development proposals

submitted for the Indonesian Student Entrepreneurship Expo (Expo KMI) or through pre- and post-test results of the training or coaching programs. The outcomes of the incubation are evaluated through sales revenue and business profit before and after the incubation process. The achievement of the development goals is evaluated through the number of students who won awards in the Expo KMI or other national entrepreneurship competitions. Data on the results of entrepreneurship education activities, such as reports, business plan proposals, and competition results, were collected and analyzed to assess the outcomes of the entrepreneurship education programs.

Entrepreneurship education needs to be designed clearly to achieve the objectives of entrepreneurship education, which consist of the entrepreneurship competencies of students, including beginner, intermediate, and advanced entrepreneurship competencies, through a collaborative ecosystem of entrepreneurship that includes academics, business, community, government, and media (see Figure 4). Further activities for the development of entrepreneurial competencies include expanding knowledge, changing the mindset, motivating, improving skills, and the ability to develop businesses through training and mentoring in entrepreneurship, business incubation, and national virtual entrepreneurship competitions.

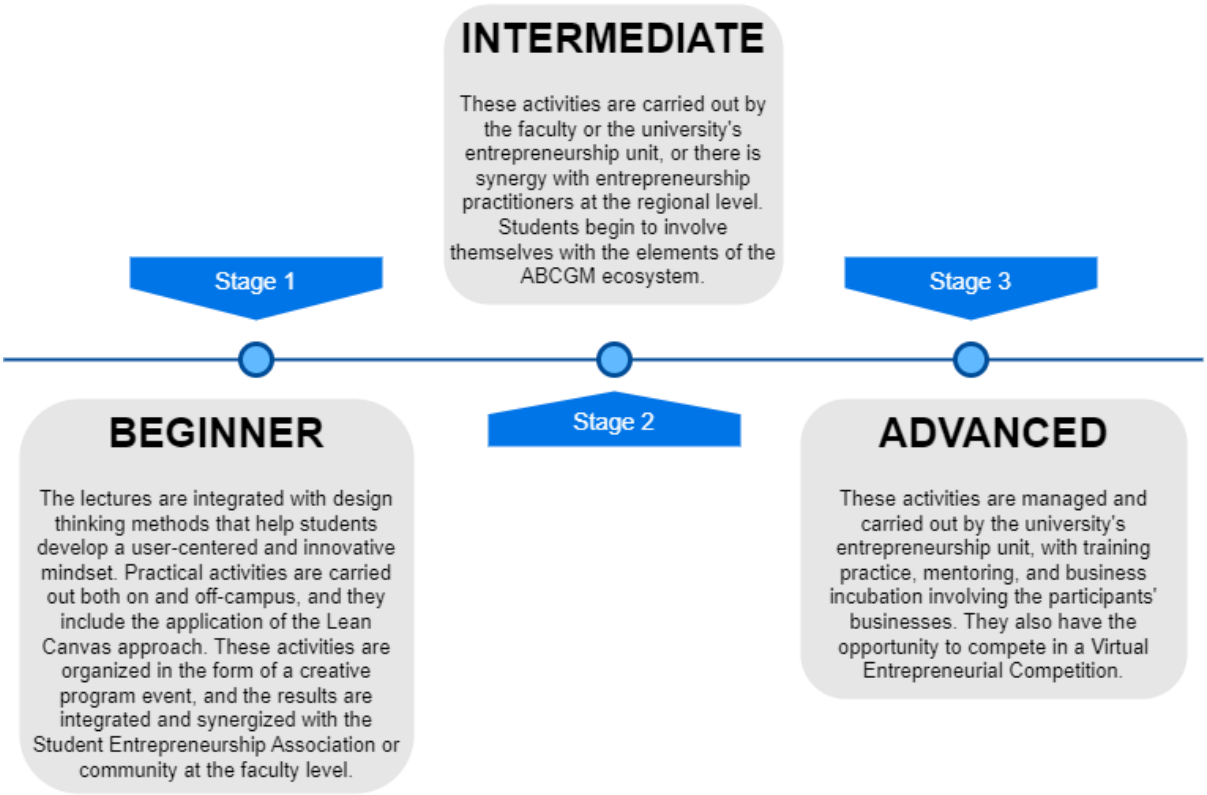

Figure 4. Beginner, intermediate, and advance entrepreneurial education activitie

Discussion, Conclusion and Implications

The results of this study revealed that entrepreneurial education activities and methods for cultivating beginner entrepreneurship competencies include lectures conducted at the departmental level that are integrated with design thinking methods. Practical activities are carried out both on- and off-campus and include the application of the Lean Canvas approach. These findings align with those of Monge-Agüero et al. (2022), who found that lectures at the departmental level are essential for entrepreneurial education. The study also reveals the importance of integrating and synergizing entrepreneurship education with academic knowledge and experiences, which is consistent with the results of Aldianto et al. (2018), who emphasized the importance of integrating science and technology with the spirit of entrepreneurship. The integration of design thinking and Lean Canvas approaches in the proposed framework offers a comprehensive and practical model for students to develop and refine their entrepreneurial skills, addressing the gaps identified in prior studies.

Based on the results of the research and discussion, as well as the entrepreneurship education design, the following conclusion can be drawn: Entrepreneurship education based on design thinking model is defined as the integration and synergy of content, activities, and methods to develop insights, thinking patterns, attitudes, motivation, knowledge, skills, and entrepreneurship experiences, so that individuals can find entrepreneurial ideas and solutions to solve problems. The creative entrepreneurship approach based on the Lean Canvas business model helps students hone their skills to produce effective solutions to a problem, through a thinking framework to describe how a business can create value and capture some of the value it creates. Entrepreneurship education needs to be designed clearly to achieve the objectives of entrepreneurship education, which consist of the entrepreneurship competencies of students, including beginner, intermediate, and advanced entrepreneurship competencies, through a collaborative ecosystem of entrepreneurship that includes academics, business, community, government, and media. Further activities for the development of entrepreneurial competencies include expanding knowledge, changing the mindset, motivating, enhancing skills, and the ability to develop businesses through training and mentoring in entrepreneurship, business incubation, and national virtual entrepreneurship competitions.

The study demonstrates the need for continuously evaluating entrepreneurial education and integration with students' academic knowledge and experiences. Despite providing valuable

insights, this study has a few limitations, which include the need for longitudinal research, exploration of alternative approaches, and applicability in different cultural and educational contexts. In conclusion, the study offers critical insights for enhancing entrepreneurial education and encourages practitioners and educators to develop comprehensive, integrative, and collaborative programs. Future research should focus on validating the proposed model, exploring alternative approaches, and examining its applicability under various settings to ensure model effectiveness and generalizability.

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