

Development of an Entrepreneurship Education Ecosystem Framework at Universitas Syiah Kuala using Soft System Methodology

¹Rahmat Fadhil, ²Hendra Halim, ³Mustanir Yahya & ⁴Sayyid Afdhal El Rahimi

¹Department of Agricultural Engineering, Faculty of Agriculture, Universitas Syiah Kuala, Banda Aceh

²Department of Islamic Economics, Faculty of Economics and Business, Universitas Syiah Kuala, Banda Aceh

³Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Syiah Kuala, Banda Aceh

⁴Department of Marine Science, Faculty of Marine and Fisheries, Universitas Syiah Kuala, Banda Aceh

Email: rahmat.fadhil@usk.ac.id

Abstract

This study aims to develop an integrated entrepreneurial education ecosystem framework at Universitas Syiah Kuala by utilizing the Soft System Methodology (SSM) approach. The research addresses the challenges and complexities in implementing entrepreneurship programs across different faculties and units within the university. The study employed qualitative methods, including in-depth interviews, focus group discussions, and document analysis, involving key stakeholders such as university leaders, lecturers, students, alumni, and external partners. The research followed seven stages of SSM, from problem situation analysis to the formulation of conceptual models and recommended actions. The results identified six critical components necessary for building a sustainable entrepreneurial education ecosystem: integrated governance and policies, curriculum and learning innovation, incubation and funding support, structured mentoring and networking systems, innovation and entrepreneurial culture, and data-driven monitoring and evaluation mechanisms. Based on these findings, the study proposed a visual ecosystem framework and concrete action plans for ecosystem enhancement. The final conclusion emphasizes the need for institutional commitment, cross-sectoral collaboration, and adaptive strategies to foster a conducive environment for entrepreneurial development in higher education. This research contributes to the theoretical understanding of ecosystem-based entrepreneurship education and offers practical policy implications for universities seeking to embed entrepreneurship as a core institutional value.

Keywords entrepreneurial education ecosystem, soft system methodology, Universitas Syiah Kuala, conceptual model, higher education.

1. Pendahuluan

Entrepreneurship education in higher education institutions has emerged as a key pillar in driving economic growth, innovation, and job creation across countries (Allahar & Sookram, 2019; Meoli et al., 2020). As centers for knowledge and innovation, universities play a strategic role in developing a sustainable and inclusive entrepreneurial ecosystem (Halim, Fadhil, et al., 2024; Halim, Kesuma, et al., 2024; Mitra & Berg, 2018; Mulyany et al., 2023). In Indonesia, strengthening entrepreneurship education has become increasingly relevant in the face of globalization, technological disruption, and the urgent need to cultivate a young generation that

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

is adaptive, creative, and capable of creating new business opportunities (Kozhakhmetov et al., 2016).

Universitas Syiah Kuala (USK) as one of the leading universities in Indonesia, holds significant potential to become a driving force in the development of the entrepreneurial ecosystem in Aceh and its surrounding regions. However, the development of an effective entrepreneurship education ecosystem at USK continues to face numerous challenges, including limited cross-sector collaboration, a lack of integration between curriculum and entrepreneurial practice, and systemic dynamics within the university's internal and external environments (Allahar & Sookram, 2019; Mitra & Berg, 2018).

Despite the implementation of various entrepreneurship programs at USK, outcomes remain suboptimal in terms of producing graduates who are truly prepared to become independent entrepreneurs. Internal university data indicate a low conversion rate of students into entrepreneurs post-graduation and a limited number of startups emerging from the campus environment. This issue is not unique to USK; it is a common phenomenon in many universities in Indonesia and other developing countries (Kozhakhmetov et al., 2016; Meoli et al., 2020).

Previous studies highlight that one of the primary causes of this stagnation is the absence of a holistic and integrated entrepreneurship education ecosystem. Such an ecosystem should involve multiple stakeholders (faculty, students, government, industry, and community), supporting infrastructure (business incubators, access to funding, mentorship networks), and enabling policies and innovation culture (Allahar & Sookram, 2019; Mitra & Berg, 2018; Theodoraki et al., 2022). Recent studies have shown that partial approaches, implemented without a clearly defined ecosystem framework, yield limited and unsustainable impact (Correia et al., 2024; Myzrova et al., 2023).

Empirical evidence from international studies suggests that universities that successfully develop systemic entrepreneurial ecosystems tend to produce more innovative graduates (40% higher than traditional approaches), foster greater startup formation (2–3 times more), and enhance local economic competitiveness (Allahar & Sookram, 2019; Guerrero et al., 2021; Meoli et al., 2020; Mitra & Berg, 2018). In contrast, research in developing countries shows that universities relying solely on conventional curriculum-based approaches without ecosystem support often fail to deliver meaningful impact to society (Kozhakhmetov et al., 2016; Malecki, 2018). A five-year longitudinal study in Latin America revealed that isolated approaches resulted in business sustainability rates below 15% (Ayala-Gaytán et al., 2024).

The development of an entrepreneurship education ecosystem framework at USK is therefore crucial, given the university's strategic role in supporting the vision of Indonesia Emas 2045, which envisions the younger generation as the engine of an innovation- and entrepreneurship-driven economy. Additionally, Aceh—a region rebuilding from post-conflict and disaster—urgently needs a new, inclusive, and sustainable economic development model, one of which can be realized through the strengthening of university-based entrepreneurship ecosystems.

This study is also significant in its potential to contribute to the formulation of more effective

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

policies and strategies for entrepreneurship education, grounded in a real-world mapping of problems and stakeholder needs. As such, the findings are expected to benefit not only USK but also serve as a reference for other universities in Indonesia and developing countries facing similar challenges.

The key novelty of this study lies in the application of Soft System Methodology (SSM) in developing the entrepreneurship education ecosystem framework at USK. SSM is a systemic approach that is particularly effective for mapping, analyzing, and designing solutions to complex problems involving multiple actors and interests (Checkland & Poulter, 2007). Unlike conventional approaches, which are often linear and focus on isolated aspects, SSM enables researchers to holistically understand the dynamics, interactions, and needs of various stakeholders within the entrepreneurial ecosystem (Checkland & Poulter, 2020; Mitra & Berg, 2018).

Most prior studies tend to focus on individual components—such as curriculum, training, or business incubation—in isolation, without integrating them into a unified ecosystem framework (Allahar & Sookram, 2019; Meoli et al., 2020). Moreover, the use of SSM in the context of entrepreneurship education development in Indonesia remains limited. Therefore, this research offers a comprehensive and practical perspective for building entrepreneurial ecosystems in higher education institutions.

This study aims to develop a framework for entrepreneurship education ecosystems at Syiah Kuala University using the Soft System Methodology. Specifically, it seeks to: (1) Map the existing conditions of the entrepreneurship education ecosystem at USK, including actors, infrastructure, policies, and innovation culture; (2) Identify key problems and stakeholder needs in the development of the entrepreneurial ecosystem; (3) Design a holistic, integrated, and adaptive ecosystem framework that is responsive to internal and external university dynamics; and (4) Provide strategic recommendations for the implementation and strengthening of the entrepreneurship ecosystem at USK.

This research is both important and timely as it proposes innovative solutions to long-standing challenges in entrepreneurship education development, particularly in the Indonesian context. By adopting the SSM approach, the study goes beyond merely offering a theoretical framework and provides an actionable roadmap that can be adapted by other higher education institutions. Furthermore, it contributes to the limited body of literature on entrepreneurial ecosystems in Southeast Asia, which has traditionally been dominated by studies from developed countries (Allahar & Sookram, 2019; Meoli et al., 2020).

The main contribution of this study is the provision of an SSM-based model for developing entrepreneurship education ecosystems that is applicable across diverse university settings. It offers a deep understanding of the dynamics, challenges, and opportunities involved in building such ecosystems, serving as a valuable reference for policymakers, education practitioners, and researchers in designing strategies to strengthen entrepreneurship in higher education.

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

2. Tinjauan Literatur

The Concept of Entrepreneurial Ecosystems in Higher Education. This study is particularly relevant in light of the growing interest in entrepreneurial ecosystems over the past decade, both in academic research and practical implementation (Wurth et al., 2023). Maritz et al. (2022) noted that only a limited number of higher education institutions have actively developed comprehensive entrepreneurship programs, such as Institut Teknologi Bandung, IPB University, and Universitas Ciputra. This highlights the urgent need for a more systematic approach to entrepreneurship education development in Indonesia. In higher education, entrepreneurship education is recognized as a key driver of regional economic growth and job creation (Queissner et al., 2024). However, in developing countries such as Indonesia, its implementation continues to face structural and cultural challenges, underscoring the need for a systemic solution. An entrepreneurial ecosystem can be defined as a network of interactions among various actors, institutions, and processes that collectively support the creation and growth of new ventures (Malecki, 2018). A bibliometric analysis of 51 articles published between 2006 and 2019 identified three dominant thematic clusters within university-based entrepreneurial ecosystem research (Kansheba & Wald, 2020): (1) The role of the higher education context in shaping ecosystems, (2) The evolution and challenges of entrepreneurship education, and (3) Models of academic entrepreneurial ecosystems.

Models and Frameworks of Entrepreneurial Ecosystems. Several prominent models of entrepreneurial ecosystems have been developed by scholars, including: (1) Isenberg (2010) Model: Highlights six core domains: policy, finance, culture, support, markets, and human capital; (2) Spigel (2017) Framework: Focuses on three main components: cultural, material, and social attributes; (3) Stam (2015) Model: Maps the relationships between ecosystem elements and entrepreneurial activities at the regional level. A recent meta-analysis using Stam (2015) shows that different ecosystem elements influence various types of entrepreneurial activities (Queissner et al., 2024). For example, social capital has a stronger impact on productive entrepreneurship, while government policies more strongly affect general entrepreneurship; (4) Leydesdorff & Etzkowitz (1995) Triple Helix Model emphasizes the importance of collaboration between universities, industry, and government in fostering innovation and economic growth. In the context of entrepreneurship education, this ecosystem encompasses relevant curricula, support infrastructure such as business incubators, and robust mentorship networks. Cahyani et al. (2022) found that university support—including facility provision, training, and mentoring—positively influences students' entrepreneurial mindset development.

Challenges of Entrepreneurship Education in Developing Countries. The implementation of entrepreneurship education in developing countries faces a range of complex challenges. For example, a study in Iran identified critical barriers in delivering e-entrepreneurship education, including limited infrastructure and pedagogical readiness (Moghadam et al., 2012). In Sierra Leone, structural and cultural constraints were key obstacles to the success of entrepreneurship programs (Mbeteh & Pellegrini, 2018). In Rwanda, research revealed that comprehensive teacher training significantly enhances the effectiveness of entrepreneurship instruction

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

(Blimpo & Pugatch, 2021). Ambarita & Utama (2024) found that, although entrepreneurship education positively affects students' entrepreneurial readiness, an unsupportive ecosystem can hinder their actual entrepreneurial development. These findings collectively underscore the need for a more holistic and systemic approach to developing entrepreneurship education ecosystems in developing country contexts.

Soft System Methodology (SSM) in Developing Entrepreneurship Education Ecosystems. Soft System Methodology (SSM) is a structured approach used to address complex problems in poorly defined social systems (Françoze et al., 2022; Fadhil et al., 2018). SSM offers a flexible framework for understanding and improving problematic situations through seven key stages (Antunes et al., 2016; Checkland & Poulter, 2020): (1) Identifying the problem situation, (2) Expressing the problem situation, (3) Formulating root definitions, (4) Developing conceptual models, (5) Comparing models with real-world conditions, (6) Defining desirable and feasible changes, and (7) Taking action to improve the situation. In the higher education context, SSM has been successfully applied to address various complex challenges, including curriculum development, improving teaching and learning quality, and strengthening entrepreneurship ecosystems (Ali, 2020). This methodology enables a deep understanding of diverse stakeholder perspectives and integrates them into holistic solutions. The use of SSM in this study is based on several key considerations: (1) Complexity of Entrepreneurial Ecosystems – SSM is well-suited to address complex and dynamic systems, such as university-based entrepreneurship ecosystems (Strielkowski et al., 2023); (2) Multi-Stakeholder Involvement – SSM facilitates the integration of diverse viewpoints from academics, practitioners, students, and industry actors (Françoze et al., 2022; Yusuf et al., 2022; Firmansyah et al., 2024); (3) Contextual Flexibility – SSM allows for the adaptation of models to local contexts, such as the specific institutional characteristics of Syiah Kuala University and the sociocultural dynamics of Aceh (Novela et al., 2021).

3. Metode Penelitian

This study employs an exploratory qualitative approach using the Soft System Methodology (SSM) developed by (Checkland & Poulter, 2020). SSM was selected due to its suitability for addressing complex and ill-structured problems, particularly in social systems such as the development of entrepreneurship education ecosystems in higher education institutions (Fadhil et al., 2021), this methodology enables the researcher to explore multiple stakeholder perspectives and identify systemic and participatory solutions. The research was conducted at Syiah Kuala University, Banda Aceh—one of Indonesia's leading public universities actively promoting student entrepreneurship through academic programs and business incubation initiatives. This context was chosen due to the urgent need for a more integrated, systematic, and sustainable entrepreneurial ecosystem framework.

The research subjects consisted of key stakeholders directly involved in the design and implementation of entrepreneurship education and development, including: Lecturers teaching entrepreneurship-related courses, Managers of entrepreneurship incubators, Supervising faculty for student entrepreneurship programs, Student entrepreneurs, Entrepreneurial alumni,

Seminar Nasional FMI 2025 Batam

Prosiding



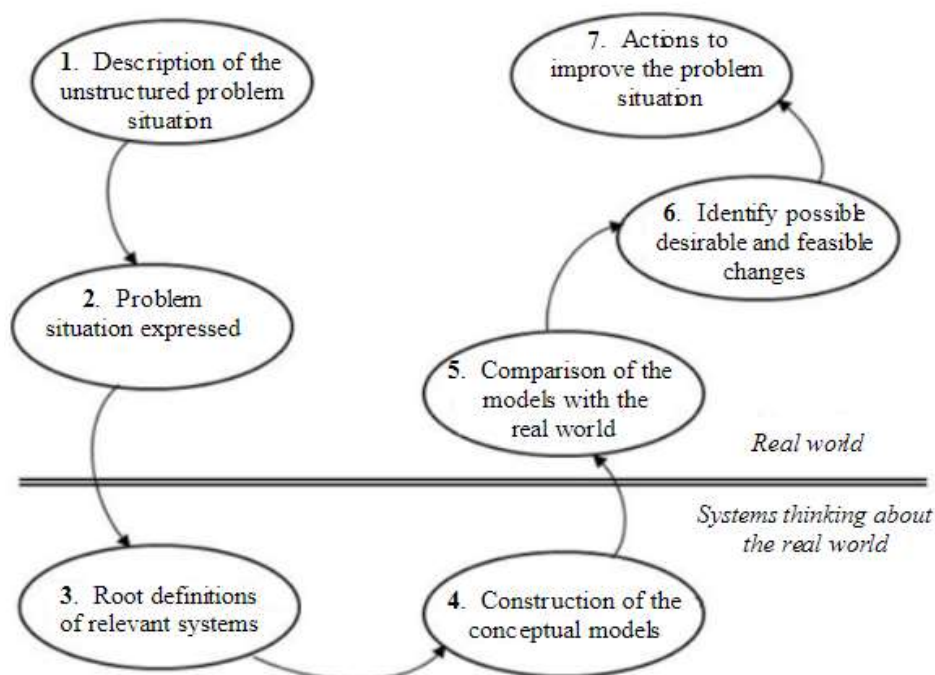
e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

Industry and SME partners, and University-level administrative representatives. Purposive sampling was employed to select informants based on their direct involvement and expertise in the field of entrepreneurship. The study follows the seven core stages of the Soft System Methodology, as outlined by Checkland & Scholes (1999): (1) Stage 1: Unstructured Problem Situation. Initial identification of the conditions and problems within USK's entrepreneurial system through early observations and informal discussions. (2) Stage 2: Expressed Problem Situation. Visualization of the situation using the Rich Picture technique, a visual representation capturing the complexity of stakeholder relationships and existing problems. (3) Stage 3: Root Definition Formulation. Development of a root definition of the desired transformation system using the CATWOE framework (Customers, Actors, Transformation, Weltanschauung, Owners, and Environmental Constraints). (4) Stage 4: Conceptual Model Development. Construction of a conceptual model of ideal system activities that illustrate how the entrepreneurial system should operate based on the defined root. (5) Stage 5: Comparison Between Conceptual Model and Reality. Comparison of the conceptual model with real-world conditions to identify gaps, perception differences, and areas for improvement or enhancement. (6) Stage 6: Identification of Feasible and Desirable Changes. Identification of technically feasible and culturally desirable system changes based on the model–reality comparison outcomes. (7) Stage 7: Action to Improve the Situation. Formulation of actionable recommendations for system improvement, including the design of an entrepreneurial ecosystem framework for implementation at Syiah Kuala University.

Figure 1. The steps of Soft System Methodology (Antunes et al., 2016)



Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499
Vol. 3
21-23 Oktober 2025

4. Hasil dan Pembahasan

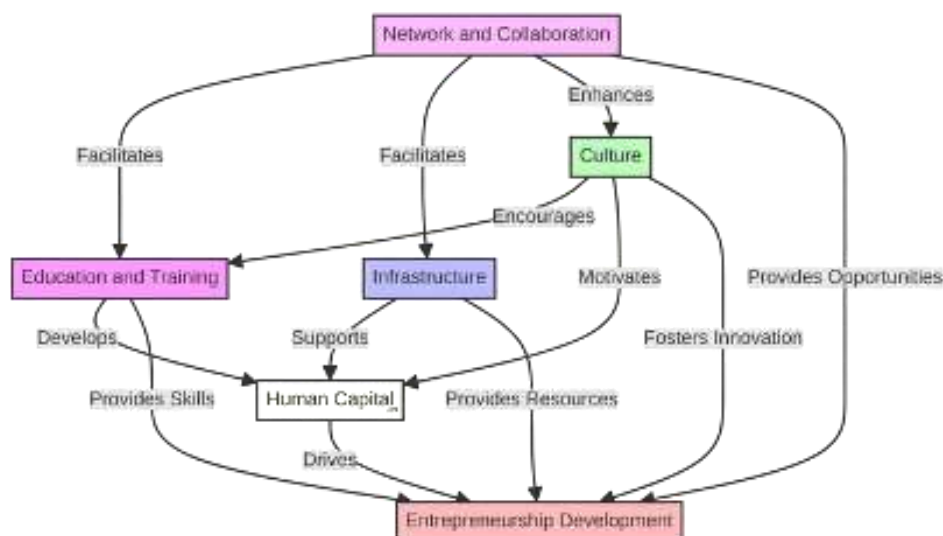
4.1 Unstructured Problem Situation

The initial stage in the Soft Systems Methodology (SSM) is to understand the unstructured problem situation. In this research, this stage was conducted to comprehensively identify the obstacles and potential in developing an entrepreneurship education ecosystem at Syiah Kuala University (USK). The approach was carried out through field observations, exploratory interviews with key stakeholders, and an initial analysis of processes and policies related to entrepreneurship within the university.

Over the past three years, USK has strived to build an entrepreneurial culture through the introduction of entrepreneurship courses, an entrepreneurship incubator, and participation in various national programs such as *Program Kreativitas Mahasiswa (PKM) Kewirausahaan*, *Program Pembinaan Mahasiswa Wirausaha (P2MW)*, *Kewirausahaan Mahasiswa Indonesia (KMI) Expo*, *Program Penguatan Kapasitas Organisasi Kemahasiswaan (PPK Ormawa)*, *Pengabdian Kewirausahaan*, and *Program Wirausaha Merdeka*. That includes independently initiated programs within USK, such as *1000 Wirausaha Muda USK (WMU)*, *Pendanaan Internal Kewirausahaan USK (PIKU)*, *Peuna Mahasiswa (Kansis)*, *Expo Kewirausahaan USK*, and most recently *Wirausaha Berdaya USK (WBU)*.

However, initial observations and discussions with stakeholders revealed that the existing entrepreneurship system has not yet had an immediate impact on producing students or alums who are empowered in entrepreneurship. Efforts to build integration within a functional and systematic university entrepreneurship ecosystem framework are ongoing. Therefore, the process of continuous improvement and development must be created and modified in accordance with the wisdom, character, and culture of the local community.

Figure 2. Diagram ekosistem kewirausahaan universitas



Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499
Vol. 3
21-23 Oktober 2025

The university entrepreneurship ecosystem diagram (Figure 2) illustrates that this system involves complex interactions among various key elements: network and collaboration, culture, education and training, infrastructure, human capital, and entrepreneurship development. However, in reality, the relationships between these elements at USK are not yet fully realized, are fragmented, and are still evolving towards a systemic approach. Based on the diagram structure, problematic situations are identified as shown in Table 1.

Table 1. Situasi Problematis di Universitas Syiah Kuala

No	Item	Problem
1	Network and Collaboration	Collaboration between universities, industry, communities, and alums is not yet optimal. Some entrepreneurial activities have been implemented effectively; however, the networks need to be further expanded. The effectiveness of systemic platforms that bridge collaboration across faculties, study programs, and with the business world needs to be developed, including exploring various opportunities for local government involvement.
2	Culture	An entrepreneurial culture among lecturers and students has yet to be firmly established. The paradigm of "work after graduation" remains dominant, rather than "creating jobs." Entrepreneurial activity is not yet considered an integral part of the academic culture and is actively supported.
3	Education and Training	Not all faculties implement entrepreneurship courses. The entrepreneurship curriculum does not comprehensively develop practical competencies. Many entrepreneurship courses are still theory-based with no concrete connection to real business projects. Entrepreneurship education and training are not integrated with the campus business incubator and development ecosystem.
4	Infrastructure	Physical infrastructure, such as co-working spaces, innovation laboratories, and business promotion tools, remains limited. Digital infrastructure to support student business activities (e-commerce, mentor information systems, etc.) is either not yet available or not optimally utilized.
5	Human Capital	Students have the potential to develop, but their interest and motivation remain low. Systematic support is needed in the form of training, mentoring, and developing their entrepreneurial capacity. The role of lecturers and alums as mentors or role models needs to be well-structured, including recognition for lecturers who assist students in entrepreneurship.

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

6	Entrepreneurship Development	Entrepreneurship development is not yet strong enough to become mainstream within the university education system. Startup funding, incubation, and acceleration programs remain limited, posing challenges to their sustainability. A monitoring and evaluation system is needed to map the longitudinal growth of students and alums entrepreneurship.
---	------------------------------	--

The situation at hand is complex and systemic, involving numerous actors, policies, and scattered support structures. The problem cannot be solved solely with technical or administrative solutions, but requires a social systems approach that facilitates cross-unit dialogue and active collaboration among ecosystem elements. For example, human capital (students) requires not only education and training but also cultural motivation, access to infrastructure, network support, and tangible opportunities for external collaboration. Therefore, failure to connect these elements can stagnate the university's entrepreneurial development.

From the above, it is clear that Universitas Syiah Kuala requires a holistic and structured framework for an entrepreneurial ecosystem. Interventions should include: (1) a comprehensive mapping of entrepreneurial actors and functions on campus; (2) coordination between units to design shared policies and practices; (3) creation of support systems such as information platforms, academic incentives, and incentive systems for mentors and alums; and (4) involvement of external stakeholders to create long-term synergies.

4.2 Expressed Problem Situation

A Rich Picture is a visual representation of a complex and unstructured problem situation, aiming to capture the overall dynamics within a social system. In the context of developing a university entrepreneurship ecosystem, a Rich Picture is designed to illustrate the relationships between actors, processes, barriers, and resource flows within the system.

The Rich Picture aims to represent the interactions among key actors, including students, lecturers, incubator managers, alums, industry partners, and local government. It illustrates the flow of activities and dependencies among components, including training, incubation, mentoring, evaluation, and funding. It also uncovers systemic issues, including inconsistent policies, a weak culture of innovation, limited facilities, program fragmentation, and inadequate monitoring.

Prosiding

```
graph TD
    Students[Students] -- Participate in --> Lecturers[Lecturers]
    Students -- Mentor --> Lecturers
    Lecturers -- Collaborate with --> IndustryPartners[Industry Partners]
    IndustryPartners -- Collaborate with --> Lecturers
    IndustryPartners -- Support --> BusinessIncubatorManager[Business Incubator Manager]
    BusinessIncubatorManager -- Engage --> Lecturers
    BusinessIncubatorManager -- Engage --> Funding[Funding]
    Funding -- Provide --> Monitoring[Monitoring]
    Monitoring -- Engage --> BusinessIncubatorManager
    BusinessIncubatorManager -- Evaluate --> Lecturers
    Lecturers -- Evaluate --> BusinessIncubatorManager
    Lecturers -- Receive --> InconsistentPolicies[Inconsistent Policies]
    InconsistentPolicies -- Preceive --> Lecturers
    InconsistentPolicies -- Causes --> LackOfInvolving[Lack of Involving]
    LackOfInvolving -- Causes --> LackOfMonitoring[Lack of Monitoring]
    LackOfMonitoring -- Causes --> Fragmentation[Fragmentation of Programs]
    Fragmentation -- STOP --> InconsistentPolicies
```

4.3 Root Definition Formulation

The third stage in Soft Systems Methodology (SSM) is Root Definition Formulation, which involves formulating a core definition of the desired system. This root definition will serve as the basis for developing a conceptual model in the next stage. To ensure the root definition reflects a holistic view, the CATWOE framework, which encompasses the main elements of the system, is used. The root definition for Entrepreneurship Education Ecosystem Development at Universitas Syiah Kuala is presented in Table 2.

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499
Vol. 3
21-23 Oktober 2025

Table 2. Analysis of CATWOE

	Description	Result Definition
C	Customers	Universitas Syiah Kuala students who want to develop their entrepreneurial spirit and competencies. Alumni who are entrepreneurs and want to expand their businesses. The wider community that benefits from job creation, product innovation, and socio-economic impact. Internal campus units (faculties, career institutes, entrepreneurship incubators, the Business Directorate) that achieve synergy and efficiency through an integrated system.
A	Actors	Lecturers and educational staff who foster entrepreneurship in both academic and non-academic fields. Managers of the Entrepreneurship Directorate and entrepreneurship incubators. Industry partners and external mentors from the business world. Career development units, research institutes, and other work units on campus. Students as co-creators, not just beneficiaries.
T	Transformation	Transforming the campus' fragmented, uncoordinated, and minimally collaborative entrepreneurship ecosystem into an integrated, collaborative, and sustainable one. Increase the active involvement of all stakeholders in the learning, incubation, mentoring, and commercialization of student businesses. Foster an innovative environment that supports the growth of startups, creativity, and the formation of student entrepreneurs.
W	Weltanschauung	A holistic and collaborative entrepreneurship education ecosystem will produce innovative, adaptive graduates who are ready to create jobs and contribute to local and national economic development. The key to the success of an entrepreneurial ecosystem in higher education is systemic support across units and multi-stakeholder collaboration.
O	Owner	The Chancellor and university leaders as the highest authority in the system. The Vice Chancellor for Student Affairs and Entrepreneurship, Faculty Leaders, the Director of the Directorate of Entrepreneurship and Alumni, and the Entrepreneurship Center. Local governments, in terms of policy support and collaboration incentives.

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

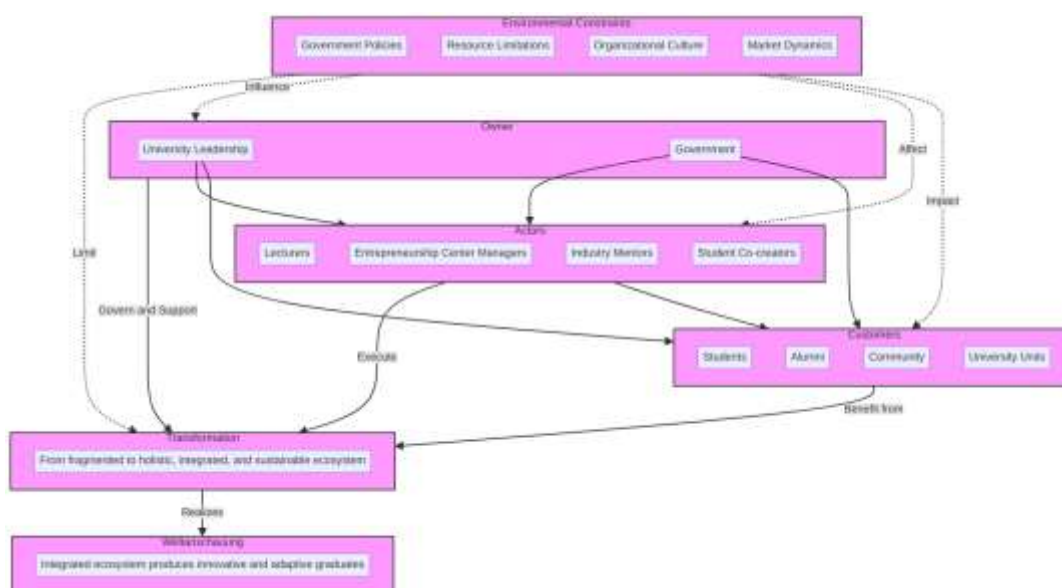
21-23 Oktober 2025

E	Environmental Constraints	Central/regional government policies and regulations related to education and entrepreneurship. Limited funding, infrastructure, and human resources. Organizational culture and resistance to change. Academic activities of students and lecturers. Technological developments, changing business trends, and market dynamics.
Root Definition: A university-based entrepreneurial education ecosystem, operated by lecturers, entrepreneurship center managers, industry partners, and students as co-creators, for students and alumni as beneficiaries. This system transforms a fragmented and unintegrated entrepreneurship education environment into a holistic, integrated, collaborative, and sustainable ecosystem. It is based on the belief that a strong and collaborative entrepreneurial ecosystem will produce innovative and adaptive graduates capable of creating new business opportunities, thus contributing to regional and national economic development. The system is owned by the university leadership and constrained by government policies, resource availability, organizational culture, and market and technology dynamics.		

4.4 Conceptual Model Development

This conceptual model was developed in response to the results of the systemic analysis of Rich Picture, CATWOE, and Root Definition in Stages 1–3. This model describes an ideal system for developing a holistic, adaptive, and sustainable entrepreneurship education ecosystem at Universitas Syiah Kuala (Figure 4).

Figure 4. CATWOE of Entrepreneurship Education Ecosystem Development at Universitas Syiah Kuala



Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499
Vol. 3
21-23 Oktober 2025

This model aims to transform the currently fragmented entrepreneurial environment into an integrated ecosystem that produces innovative, competitive graduates capable of creating sustainable jobs (Malecki, 2018). The model is built on six main pillars, each designed to address the needs and challenges identified in the previous phase (Table 3).

Table 3. Formulation of Conceptual Framework Integration

No	Aspect	Formulation
1	Strengthening Governance and Policy	Establishment of a cross-faculty Entrepreneurship Development Office (EDO). Integration of entrepreneurship courses across all study programs. Awards for lecturers and students active in business development. A minimum of 5% of the research budget is directed towards entrepreneurship activities (Weiss, 2024).
2	Competency-Based Curriculum and Learning	Curriculum Content: Basic courses for all students (mandatory), Specializations based on interests and industry, and local and global case studies. Teaching Methodology: Project-based learning, simulations, and internships. Evaluation: Portfolio-based assessments. 360° feedback from lecturers, mentors, and teams.
3	Business Incubation and Acceleration	Physical Facilities: Co-working space, prototyping lab, pitching room. Supporting Programs: Selective seed funding, pre-incubation program (3 months), startup acceleration (6–12 months). Supporting Experts: Legal consultants, UX designers, digital marketing specialists.
4	Mentoring and Network Strengthening	Mentor Recruitment: Practitioners, successful alums, industry experts. Mentoring Format: One-on-one mentoring, group mentoring, and office hours with experts. Relationship Ecosystem: Business associations, investors and venture capitalists, business events and expos.
5	Developing a Culture of Innovation	Innovative Activities: Business competitions, regular pitching sessions, and design thinking workshops. Supporting Policies: Academic leave for student entrepreneurs, credits for business activities. Creative Facilities: Idea space and innovation gallery, student achievement wall of fame.
6	Continuous Monitoring and Evaluation	Performance Indicators: Number of startups, 3-year business continuity, job creation. Evaluation Methods: Annual survey, in-depth interviews, tracking platform. Follow-up: Quarterly evaluation forum, quick feedback system, benchmarking with leading universities.

Seminar Nasional FMI 2025 Batam

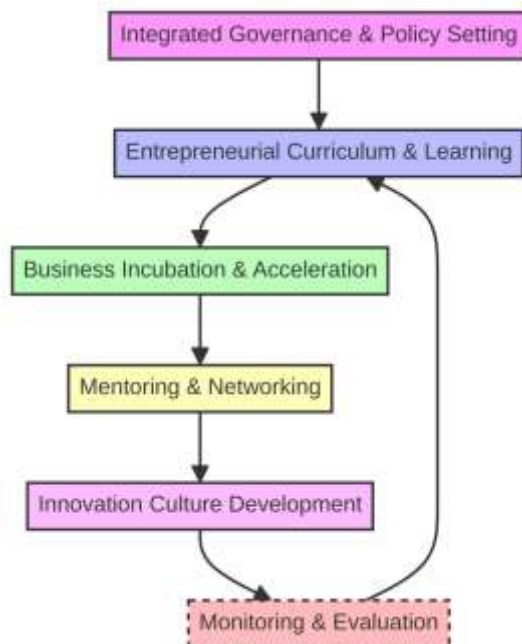
Prosiding



e-ISSN: 3026-4499
Vol. 3
21-23 Oktober 2025

All of the above pillars are interconnected and form an adaptive, cyclical system. The visualization in Figure 5 provides a comprehensive illustration of the university's entrepreneurship system workflow. This cycle is designed to be mutually reinforcing and feedback-driven. Evaluation data is used to refine the curriculum, incubation methods, and strengthen networks, ensuring the ecosystem continues to grow (Ali, 2020; Strielkowski et al., 2023, Fadhil et al., 2024).

Figure 5. Conceptual model of Entrepreneurship Education Ecosystem Development at Universitas Syiah Kuala



4.5 Comparison between Model and Real-Life Situation

The fifth stage in the Soft Systems Methodology (SSM) aims to compare the conceptual (ideal) model developed in Stage 4 with the actual reality on the ground (USK) depicted in the Rich Picture in Stage 2 and the CATWOE analysis in Stage 3. Through this comparison, gaps between "what is happening" and "what should be happening" are identified, as well as priority areas for intervention and improvement.

The comparison was conducted using a data triangulation approach, namely: (1) Comparing the main activities in the conceptual model with actual practices on the ground. (2) Through interviews, Focus Group Discussions (FGDs), and participant observation with students, lecturers, incubator managers, industry partners, and university leaders. (3) Reviewing policy documents, activity reports, and statistical data from relevant units. The comparative results between the conceptual model of the entrepreneurial ecosystem at USK and the actual reality are presented in Table 4.

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

Table 4. The comparison of model and reality

Activity	Real Condition	Recommendation
Integrated Policy and Governance	Policies are scattered across various units, with no central coordination.	Form cross-faculty/unit teams to holistically manage the entrepreneurial ecosystem.
Entrepreneurship Curriculum & Learning	Courses are not yet integrated, and methods remain conventional.	Integrate entrepreneurship across all study programs using a project-based, collaborative approach, and project proposal outputs.
Business Incubation & Acceleration	Incubators exist, but their capacity is limited, and access to funding is minimal.	Increase incubator capacity and expand access to funding programs such as grants, seed funding, and investors.
Mentoring & Networking	Mentoring is sporadic, and industry networks are not yet strong.	Establish a structured mentoring system and activate industry and alumni networks.
Culture of Innovation & Entrepreneurship	Activities are incidental, and student participation is low.	Facilitate community outreach, business idea competitions, and role models to foster student entrepreneurial interest.
Monitoring & Evaluation	Monitoring and evaluation systems are not yet structured.	Design a data-driven monitoring and evaluation system with clear performance indicators.

4.6 Identifying Feasible and Desirable Changes

The sixth stage in Soft Systems Methodology (SSM) aims to identify systemic changes that are feasible and desirable for all stakeholders. This stage is a logical continuation of the previous process, in which researchers: (1) explored the problematic reality through rich picture analysis, (2) formulated relevant systems through CATWOE and root definition, and (3) created a conceptual model based on transformational activities. These changes are identified by comparing the conceptual model (ideal system expectations) with the current situation through gap analysis. The result is a list of logical, relevant, and feasible changes that serve as a foundation for system improvement.

To ensure linkage with the previous systemic analysis, the identified changes must meet the following criteria: (1) technically feasible (Feasible): in line with the organization's resources and capacity. (2) culturally desirable (Desirable): in line with the values, norms, and aspirations

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499
Vol. 3
21-23 Oktober 2025

of stakeholders (the C in CATWOE). (3) aligned with the formulated system transformation (the T in CATWOE). (4) Support the primary roles of Actors and Owners (A and O in CATWOE) so that changes can be implemented and supported. Based on the results of the gap analysis between the actual situation and the conceptual model of the ideal entrepreneurial system, the following changes can be proposed (Table 5).

Table 5. Change Summary Matrix

Area of Change	Feasible	Desirable
Governance & Policy	Cross-unit institutional structure, campus entrepreneurship SOP.	Program synergy and integrated policy direction.
Curriculum & Learning	Curriculum revision, lecturer training, experiential learning methods.	Applied, contextual, and inspiring learning.
Incubation & Funding	Collaboration with the Cooperative Revolving Fund Management Institute (LPDB), banks and financial institutions, the Government Investment Center (PIP), and the establishment of an internal fund.	Real support for student and alumni startups.
Mentoring & Networking	Alumni and industry as structured mentors.	Knowledge transfer and extensive business networks.
Culture of Innovation & Entrepreneurship	Annual events, entrepreneurial communities, and appreciation programs.	An innovative and supportive campus environment.
Monitoring & Evaluation	Data-driven dashboard systems and performance reporting.	Continuous evaluation and data-driven decision-making.

4.7 Action to Improve the Situation

The seventh stage in the Soft Systems Methodology (SSM) is a crucial step in formulating concrete corrective actions based on the results of problem identification (rich picture), conceptual model, and gap analysis between actual and ideal conditions. These actions aim to improve complex situations, particularly in the context of developing an entrepreneurial ecosystem at Syiah Kuala University (USK). The corrective actions are designed to bridge the gap between feasible and desirable changes identified in Stage 5 and as a follow-up to the systematic comparison conducted in Stage 6. This approach is systemic, participatory, and sustainability oriented.

To strengthen an integrated entrepreneurial ecosystem within higher education institutions,

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

several strategic recommendations can be implemented (Figure 6). First, strengthening governance and policies is a crucial foundation. Universities need to establish an Entrepreneurship Ecosystem Management Team across faculties or units that reports directly to the university leadership. This team is responsible for developing and ratifying integrated policies that include standard operating procedures (SOPs), key performance indicators (KPIs), cross-unit coordination mechanisms, and other supporting regulations. These policies must be thoroughly disseminated to the entire academic community and external partners for effective implementation.

Second, curriculum development and entrepreneurship learning are crucial aspects in fostering an entrepreneurial mindset among students. Entrepreneurship courses need to be integrated into all study programs, both as compulsory and elective courses. Furthermore, innovative learning methods such as project-based learning, experiential learning, and collaboration with industry mentors must be implemented to enhance students' practical skills. Learning modules also need to be tailored to the local Acehnese context, and the global market needs to be more relevant and applicable.

Third, improving incubation, acceleration, and access to funding is key to supporting students' success in starting a business. Universities need to strengthen the presence of business incubators and co-working spaces as venues for idea development and collaboration. Acceleration programs, such as boot camps, business competitions, and expos, should also be held regularly. Funding support can be facilitated through collaborations with banks, investors, government agencies, or through internal university funding allocations, such as seed funding.

Fourth, strengthening mentoring and networking systems needs to be structured. Mentoring programs involving alums, practitioners, and industry partners will provide more applicable guidance to students. Furthermore, building collaborative networks with businesses, local governments, and entrepreneurial communities will open access to resources and business opportunities. Facilitating internships, industry studies, and experience-sharing sessions can broaden students' horizons and prepare them for the business world.

Seminar Nasional FMI 2025 Batam

Prosiding

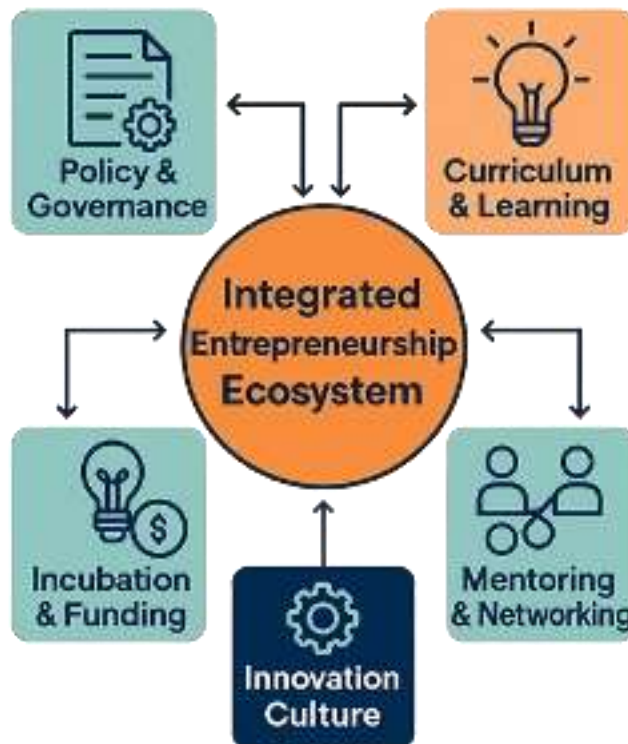


e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

Figure 6. A flowchart of development strategy of entrepreneurial ecosystem at Universitas Syiah Kuala (USK)



Fifth, fostering a culture of innovation and entrepreneurship must be consistently fostered through various activities. Universities should host regular events, such as seminars, workshops, innovation expos, and awards, for young entrepreneurs. The formation of student entrepreneurship communities in each faculty should also be encouraged as a means of interaction and business idea development. Providing incentives and awards to students, lecturers, and work units actively engaged in entrepreneurship development will increase the motivation and engagement of all parties.

Finally, developing a data-driven monitoring and evaluation (M&E) system is necessary to ensure the sustainability and effectiveness of the program. Universities need to develop a monitoring and evaluation (M&E) system that can record program achievements, identify obstacles, and explore new opportunities. Regular evaluations are also crucial, with the results serving as the basis for compiling performance reports and policy recommendations, which will be submitted to university leadership periodically. With a structured and sustainable system, the development of the entrepreneurship ecosystem in higher education can proceed optimally and measurably.

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

5. Kesimpulan

This research has successfully formulated a framework for developing an entrepreneurship education ecosystem at Syiah Kuala University, utilizing the Soft Systems Methodology (SSM) approach. Through a holistic and participatory problem exploration, it was discovered that developing entrepreneurship in higher education is not sufficient through classroom teaching alone, but requires an integrated system encompassing institutional policies, applicable curricula, incubation facilities, collaborative networks, and a culture of innovation within the academic community. Conceptual modeling results indicate that collaboration across units and stakeholders is key to establishing a sustainable entrepreneurial ecosystem.

The application of SSM in this context has helped identify the dynamics, challenges, and opportunities for developing the ecosystem systemically and humanely. Recommendations for corrective actions encompass six main pillars: strengthening governance and policies, developing curriculum and learning, enhancing incubation facilities and funding, strengthening mentoring and networking, fostering a culture of innovation, and establishing a monitoring and evaluation system. With the implementation of this framework, Syiah Kuala University is expected to become a pioneering institution in higher education-based entrepreneurship development in Aceh, while simultaneously encouraging the emergence of innovative and socially impactful young entrepreneurs.

The results of this study have important implications for policymakers at the university level and external stakeholders. First, universities need to position entrepreneurship development as an integral part of their institutional strategy, not simply an additional activity. This requires clear and structured regulations, from the formation of a cross-unit entrepreneurial ecosystem management team to the development of measurable key performance indicators (KPIs).

Second, local governments and supporting institutions such as business incubators, financial institutions, and the industrial sector need to be actively involved in establishing collaborative networks that support the growth of student startups. This support can take the form of incentive schemes, easier access to funding, integrated training programs, and leveraging local potential to encourage entrepreneurship based on local wisdom and expertise. Third, affirmative policies are necessary to enhance the role of lecturers and educational staff as facilitators of entrepreneurship, including the provision of performance-based incentives, ongoing training, and recognition of entrepreneurial activities as part of the Tri Dharma of Higher Education.

Finally, to ensure the sustainability and effectiveness of the ecosystem being developed, universities need to establish a data-driven and impact-oriented monitoring and evaluation system. This policy will enable dynamic and adaptive strategy adjustments to evolving student needs and future business environment challenges.

Acknowledgement

The author would like to express his gratitude to the Rector of Universitas Syiah Kuala for his continued support and trust in managing various entrepreneurial activities, especially for Universitas Syiah Kuala students and alums.

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

Referensi

Ali, A. (2020). *Systematic Literature Review of Soft System Method Use in Information Systems Field*.

Allahar, H., & Sookram, R. (2019). A university business school as an entrepreneurial ecosystem hub. *Technology Innovation Management Review*, 9(11).

Ambarita, N., & Utama, D. H. (2024). The Linking of Entrepreneurship Education and Entrepreneurial Readiness: The Mediating Role of Entrepreneurial Ecosystem. *Dinamika Pendidikan*, 19(1), 131–143.

Antunes, C. H., Dias, L., Dantas, G., Mathias, J., & Zamboni, L. (2016). An application of soft systems methodology in the evaluation of policies and incentive actions to promote technological innovations in the electricity sector. *Energy Procedia*, 106, 258–278.

Ayala-Gaytán, E., Villasana, M., & Naranjo-Priego, E. E. (2024). University entrepreneurial ecosystems and graduate entrepreneurship. *The Journal of Entrepreneurship*, 33(1), 88–117.

Blimpo, M. P., & Pugatch, T. (2021). Entrepreneurship education and teacher training in Rwanda. *Journal of Development Economics*, 149, 102583.

Cahyani, U. E., Hanafi, S. M., & Masruri, S. (2022). The Nexus Between University Support and Entrepreneurial Mindset: Does Entrepreneurship Education Matter? *Indonesian Journal of Business and Entrepreneurship (IJBE)*, 8(3), 351.

Checkland, P., & Poulter, J. (2007). *Learning for action: a short definitive account of soft systems methodology, and its use for practitioners, teachers and students*. John Wiley & Sons.

Checkland, P., & Poulter, J. (2020). Soft systems methodology. *Systems Approaches to Making Change: A Practical Guide*, 201–253.

Checkland, P., & Scholes, J. (1999). *Soft systems methodology in action*. John Wiley & Sons.

Correia, M. P., Marques, C. S., Silva, R., & Ramadani, V. (2024). Academic entrepreneurship ecosystems: Systematic literature review and future research directions. *Journal of the Knowledge Economy*, 1–31.

Fadhil, R., Halim., H., Novindra, N. (2024). Social Norm as a Moderating Variable on the Influence of Opportunity Recognition and Entrepreneurship Education on Students' Entrepreneurial Intention. *Prosiding Seminar Nasional FMI 2024 Manado*, 2, 1439-1452.

Fadhil, R., Qanytah, Q., Hastati, D. Y., & Maarif, M. S. (2018). Development Strategy for a Quality Management System of Gayo Coffee Agro-Industry Using Soft Systems Methodology. *Periodica Polytechnica Social and Management Sciences*, 26(2), 168–178.

Fadhil, R., Yusuf, M. Y., Bahri, T. S., Maulana, H., & Fakhurrizi, F. (2021). Precaution Strategy of Moral Hazard Practice in Agricultural Insurance in Indonesia: An Approach of Soft Systems Methodology. *Economía Agraria Y Recursos Naturales - Agricultural and Resource Economics*, 21(2), 79–99.

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

Firmansyah, J., Ibrahim, I., & Saputra, H. (2024). Analyzing the Perceptions and Expectations of Students Towards Science Using Soft System Methodology. *Jurnal Pendidikan Progresif*, 14(1), 451-467.

Françoço, R., Paucar-Caceres, A., & Belderrain, M. C. N. (2022). Combining Value-Focused thinking and soft systems methodology: A systemic framework to structure the planning process at a special educational needs school in Brazil. *Journal of the Operational Research Society*, 73(5), 994-1013.

Guerrero, M., Liñán, F., & Cáceres-Carrasco, F. R. (2021). The influence of ecosystems on the entrepreneurship process: a comparison across developed and developing economies. *Small Business Economics*, 57(4), 1733-1759.

Halim, H., Fadhil, R., & El Rahimi, S. A. (2024). *Model of University Entrepreneurial Education Development Strategy for Preparing the Golden Generation Toward 2045: Islamic Entrepreneurship Perspective*. <https://doi.org/https://doi.org/10.55927/ajma.v3i4.11901>

Halim, H., Kesuma, T. M., Siregar, M. R., Amir, F., Sari, M. D. N., & Siregar, F. A. (2024). Integrated Strategies to Enhance Entrepreneurial Intention During and After University: Islamic Entrepreneurship Perspective. *Jurnal Ekonomi Dan Bisnis Digital*, 3(1), 221-230.

Isenberg, D. J. (2010). How to start an entrepreneurial revolution. *Harvard Business Review*, 88(6), 40-50.

Kansheba, J. M. P., & Wald, A. E. (2020). Entrepreneurial ecosystems: a systematic literature review and research agenda. *Journal of Small Business and Enterprise Development*, 27(6), 943-964.

Kozhakhmetov, A., Nikiforova, N., & Maralbayeva, S. (2016). *Entrepreneurial ecosystem at universities: formation and development*.

Leydesdorff, L., & Etzkowitz, H. (1995). The triple helix---university-industry-government relations: A laboratory for knowledge based economic development. *Easst Review*, 14(1), 14-19.

Malecki, E. J. (2018). Entrepreneurship and entrepreneurial ecosystems. *Geography Compass*, 12(3), e12359.

Maritz, A., Li, A., Utami, W., & Sumaji, Y. (2022). The emergence of entrepreneurship education programs in Indonesian higher education institutions. *Entrepreneurship Education*, 5(3), 289-317.

Mbeteh, A., & Pellegrini, M. M. (2018). Entrepreneurship education in developing countries: A study of the key challenges in Sierra Leone. *African Entrepreneurship: Challenges and Opportunities for Doing Business*, 89-116.

Meoli, A., Fini, R., Sobrero, M., & Wiklund, J. (2020). How entrepreneurial intentions influence entrepreneurial career choices: The moderating influence of social context. *Journal of Business Venturing*, 35(3), 105982.

Seminar Nasional FMI 2025 Batam

Prosiding



e-ISSN: 3026-4499

Vol. 3

21-23 Oktober 2025

Mitra, J., & Berg, S.-H. (2018). Entrepreneurship education and learning systems: Developing a holistic approach to entrepreneurial universities and their ecosystems. *Education*, 1(2).

Moghadam, S. J., Zaefarian, R., & Salamzadeh, A. (2012). Challenges of entrepreneurship e-education: Evidence from a developing country. *Entrepreneurship Education-A Priority for the Higher Education Institutions*, Forthcoming.

Mulyany, R., Muhammad, S., Geumpana, T. A., Halim, H., & Pertiwi, C. D. (2023). A Potential Framework For an Impactful Technopreneurship Education. *Indonesian Journal of Business and Entrepreneurship (IJBE)*, 9(2), 208.

Myzrova, O. A., Goryacheva, T. V, Sysoeva, O. V, & Sysoev, V. V. (2023). The effect of the entrepreneurial ecosystem of universities on the innovative activity in Russian regions. *Economies*, 11(7), 190.

Novela, S., Syarief, R., Fahmi, I., & Arkeman, Y. (2021). Creating a university-based entrepreneurial ecosystem in Indonesia. *Academic Journal of Interdisciplinary Studies*, 10(1), 174.

Queissner, M., Stolz, L., & Weiss, M. (2024). A meta-analysis of entrepreneurial ecosystem elements and entrepreneurial activity. *Small Business Economics*, 1–31.

Spigel, B. (2017). The relational organization of entrepreneurial ecosystems. *Entrepreneurship Theory and Practice*, 41(1), 49–72.

Stam, E. (2015). Entrepreneurial ecosystems and regional policy: a sympathetic critique. *European Planning Studies*, 23(9), 1759–1769.

Strielkowski, W., Kuzmin, E., Suvorova, A., Nikitina, N., & Gorlova, O. (2023). Organizational economic sustainability via process optimization and human capital: a Soft Systems Methodology (SSM) approach. *ArXiv Preprint ArXiv:2311.17882*.

Theodoraki, C., Dana, L.-P., & Caputo, A. (2022). Building sustainable entrepreneurial ecosystems: A holistic approach. *Journal of Business Research*, 140, 346–360.

Wurth, B., Stam, E., & Spigel, B. (2023). Entrepreneurial ecosystem mechanisms. *Foundations and Trends® in Entrepreneurship*, 19(3), 224–339.

Yusuf, M.Y., Fadhil, R., Bahri, T.S., Maulana, H., & Firmansyah, J. (2022). Design of Islamic Agricultural Insurance Model: Evidence from Indonesia. *International Journal of Sustainable Development and Planning*, 17(8), 2375-2384.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>)