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Fostering Entrepreneurial Mindset and Innovation Skills among Pre-Service Teachers through Entrepreneurship and Community Empowerment at Universiti Tun Hussein Onn Malaysia

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Abstract

This study examines an international community service program designed to develop entrepreneurial mindset and innovation skills among pre-service teachers at Universiti Tun Hussein Onn Malaysia (UTHM). The study aims to explore how entrepreneurship education, participatory learning, experiential learning, and community empowerment can contribute to future teachers' professional development. The program involved an international seminar integrating interactive lectures, case-based discussions, group activities, reflection, and evaluation. The discussion highlights participants' engagement, emerging entrepreneurial perspectives, innovation-oriented competencies, and community-oriented learning. Particular attention is given to reframing entrepreneurship as a professional capability, experiential learning as a mechanism for innovation, and international collaboration as a foundation for sustainable teacher development. The study concludes with implications for strengthening entrepreneurship within teacher education.

Keywords: Universiti Tun Hussein Onn Malaysia, Experiential Learning, Participatory Learning, Teacher Education, Community Empowerment.

INTRODUCTION

1. Entrepreneurial Mindset in 21st-Century Teacher Education

Teacher education increasingly prepares professionals for uncertainty, technological disruption, and changing social expectations. Within this environment, an entrepreneurial mindset should be understood as a professional orientation toward recognizing opportunities, initiating action, experimenting with solutions, and creating value rather than simply as an intention to establish a business. For pre-service teachers, this orientation is relevant because classrooms require continual adaptation of learning strategies, resources, and relationships. Evidence demonstrates that 21st-century learning skills and achievement orientations are positively associated with entrepreneurship among pre-service teachers, showing that entrepreneurial capacity is intertwined with competencies required for contemporary teaching. This orientation strengthens teachers' agency and readiness for unfamiliar educational challenges in practice (Ertem, 2024).

An entrepreneurial mindset therefore expands the conventional conception of teacher competence. Creativity, flexibility, autonomy, collaboration, and innovation can enable future teachers to move from reproducing established instructional routines toward designing learning experiences that respond to learners' needs. This perspective positions teachers as opportunity creators who transform educational problems into pedagogical experimentation. Entrepreneurship education can contribute to creativity and action competence, connecting entrepreneurial learning with wider social-change objectives. Its relevance extends beyond economic activity toward responsible action and innovation in education. In this respect, teacher education can use entrepreneurship as a mechanism for developing professionals capable of responding constructively to complex educational and societal conditions (Weicht & Jónsdóttir, 2021).

This orientation becomes clearer when teachers must eventually facilitate entrepreneurial competence among their students. Teachers who understand entrepreneurship as opportunity recognition, initiative, collaboration, and value creation can design activities where students investigate problems, generate alternatives, test ideas, and reflect. This shifts entrepreneurial learning toward a cross-curricular pedagogical principle. However, evidence indicates that future teachers may possess uneven knowledge of entrepreneurial competence frameworks and their pedagogical application. Teacher preparation must therefore address both its meaning and classroom application. Such preparation is especially important because teachers influence how students interpret initiative, failure, uncertainty, and the legitimacy of generating unconventional solutions (Arruti et al., 2023).

2. The Gap between Entrepreneurship Education and Teacher Preparation

Despite growing recognition of entrepreneurship education, educator preparedness remains a challenge. It can be included in curricula without ensuring that future teachers know how to enact it. When entrepreneurial learning remains associated primarily with business creation, pre-service teachers may fail to recognize its relevance to pedagogy, citizenship, creativity, and community problem-solving. This creates a disconnect between policy ambitions and pedagogical capacity in schools. The problem is not simply exposure, but preparation to interpret and teach

entrepreneurship in educational contexts. This distinction is important for teacher education because entrepreneurial competence must be made pedagogically visible, practicable, and assessable rather than treated as an abstract policy aspiration (Pepin & Maigret, 2021).

Teacher preparation requires more than adding entrepreneurial content. Future educators need to experience authentic problem solving, collaborative inquiry, experimentation, reflection, and project-oriented learning. Research on teacher students demonstrates that transferable competencies such as creative thinking, teamwork, communication, and self-management are central to entrepreneurial development, while experiential, collaborative, authentic, and reflective activities are particularly valuable for meaningful learning. Thus, teacher preparation should model entrepreneurial pedagogy rather than merely describe it. The design of teacher education should therefore place participants in learning situations that mirror the uncertainty, agency, and collaborative decision-making associated with entrepreneurial practice (Trasberg, 2024).

Educator confidence and pedagogical identity can determine whether entrepreneurship becomes embedded in practice. University educators may feel like entrepreneurship outsiders when concepts seem unfamiliar or disconnected from disciplinary identities. Research shows that targeted professional development can increase educators' competence and confidence to integrate entrepreneurial elements across disciplines, particularly when training uses experiential learning and practical application. This highlights the need for capacity building that addresses confidence alongside conceptual understanding. Professional development can consequently serve as a bridge between institutional expectations and classroom implementation, especially when educators receive feedback and opportunities to refine their practices (Jin & Roald, 2025).

The gap is both curricular and developmental. A curriculum may identify entrepreneurship as a desired graduate competence while leaving questions about who will teach it, through which pedagogies, and with what support. Educators' pedagogical choices are shaped by self-efficacy, teaching philosophy, prior entrepreneurship training, and teaching experience, suggesting that effective entrepreneurship education cannot rely on standardized content alone. Teacher preparation should create conditions for entrepreneurial teaching identities and adaptive pedagogy. This recognizes entrepreneurship education as professional formation rather than a discrete topic. Such a developmental perspective also suggests that institutions need supportive environments, mentoring, and opportunities for experimentation if entrepreneurial teaching is expected to become sustainable (Neergård et al., 2025).

3. Community Empowerment through International Academic Collaboration

International academic collaboration can connect teacher education with knowledge exchange, cultural learning, and capacity development across boundaries. University collaboration is most meaningful when built around shared purposes rather than symbolic international activity. Research emphasizes relationship building, trust, mutual benefits, and shared understandings as foundations for sustainable partnerships. These principles matter in community-oriented programs, where outcomes depend on reciprocal engagement among institutions, educators, and participants. International collaboration can therefore function as a

mechanism for developing knowledge and professional capacity while allowing participating institutions to address educational priorities through complementary expertise and shared learning processes (Haley et al., 2024).

At Universiti Tun Hussein Onn Malaysia, international collaboration connects entrepreneurial learning with cross-cultural perspectives and community empowerment. The seminar involving Indonesian and Malaysian partners becomes a collaborative learning space where pre-service teachers encounter alternative perspectives on entrepreneurship, innovation, teaching, and social contribution. These encounters broaden educational perspectives and encourage adaptation to different institutional and community settings. Academic-community partnerships generate benefits through knowledge exchange and shared problem solving when relationships emphasize reciprocal contributions. For the UTHM program, this principle means treating international partnership as a platform for reciprocal learning rather than as a simple mechanism for delivering expertise from one country to another (Giffords & Calderon, 2015).

Sustainable community empowerment requires international collaboration to move beyond a one-off seminar toward continued relationships, shared learning, and follow-up initiatives. This means creating opportunities for pre-service teachers to transform seminar insights into classroom projects, social entrepreneurship, innovation initiatives, or community-based learning. Such continuity connects entrepreneurial mindset development with teacher education's mission of creating educational value and responding to social challenges. Evidence from informal entrepreneurship education indicates that empowerment strengthens when learning extends into sustained support and practical engagement. International collaboration can therefore catalyze professional learning, while community engagement gives that learning practical meaning. Follow-up mechanisms could include collaborative projects, mentoring, reflective communities, and subsequent exchanges that allow participants to test, refine, and share entrepreneurial teaching practices (Akullo et al., 2024).

METHODS

1. Community Service Design and Participants

This community service program was designed as an international educational empowerment initiative aimed at strengthening the entrepreneurial mindset and innovation skills of pre-service teachers. The activity was conducted through an international seminar entitled "Entrepreneurship, Innovation, and Community Empowerment," with the specific subtheme "Entrepreneurial Mindset" and the topic of developing entrepreneurial spirit among future teachers. The program was implemented at Universiti Tun Hussein Onn Malaysia (UTHM) through collaboration among Universitas Negeri Jakarta (UNJ), UTHM, and the Komunitas Dosen Multidisipliner Indonesia (KDMI). This collaborative configuration positioned the activity not merely as a conventional knowledge-transfer program, but as an academic engagement that connected teacher education, entrepreneurship, innovation, and community empowerment.

The participants were students at UTHM who were being prepared for teaching professions. Their selection was based on the strategic importance of developing entrepreneurial characteristics during higher education before participants enter professional teaching environments. The program recognized that future teachers require

competencies extending beyond pedagogical knowledge, including creativity, adaptability, initiative, collaboration, leadership, and problem-solving. These competencies are particularly important in educational environments characterized by technological transformation and changing expectations regarding the role of teachers.

The community service design was consequently oriented toward professional capacity development rather than entrepreneurship training in the narrow sense of business formation. The central concern was to help participants understand how entrepreneurial thinking can become part of their future professional identity. Through the program, entrepreneurship was presented as an approach to recognizing opportunities, generating ideas, responding to educational challenges, and creating meaningful value through learning. This design allowed the activity to connect entrepreneurship with the everyday responsibilities of teachers and with their potential contribution to students and communities.

The program was organized through several complementary stages. Initial preparation involved coordination between the community service team and UTHM partners, identification of participant needs, development of seminar materials, allocation of responsibilities among speakers, and preparation of evaluation instruments. This preparatory stage was important for ensuring that the content corresponded with the participants' developmental needs and the broader challenges faced by prospective teachers in a digitally transforming educational environment.

2. Participatory and Experiential Learning Approach

The program employed a Participatory Learning and Action approach combined with Experiential Learning. This combination was selected to ensure that participants were not positioned merely as passive recipients of entrepreneurial knowledge. Instead, they were encouraged to participate actively in discussion, interpretation, reflection, and problem-solving activities. The approach supported the transformation of conceptual knowledge into personally meaningful understanding and encouraged participants to consider how entrepreneurial principles could be applied in their future teaching practices.

The seminar incorporated several complementary learning strategies. Interactive lectures were used to establish conceptual foundations concerning entrepreneurial mindset, the changing role of teachers, innovation, and entrepreneurship in education. The lectures introduced the idea that future teachers can become opportunity creators, learning facilitators, innovators, and agents of change rather than functioning solely as transmitters of information. This conceptual foundation provided participants with a framework for interpreting entrepreneurship as a professional and educational competency.

Case-Based Learning was subsequently used to connect conceptual material with realistic educational problems. Participants were presented with cases concerning challenges faced by teachers in cultivating entrepreneurial characteristics among students in the digital era. Through these cases, participants were encouraged to identify the characteristics required of twenty-first-century teachers, consider learning strategies capable of stimulating creativity, examine ethical uses of digital technology, and formulate possible innovations for school environments.

Group Discussion provided an additional mechanism for collaborative learning. Participants worked collectively to analyze

cases, exchange perspectives, and formulate possible responses to educational challenges. The collaborative format allowed participants to encounter alternative interpretations and recognize that innovation can emerge through interaction among individuals with different experiences and perspectives. Communication and teamwork were therefore developed alongside entrepreneurial thinking.

Reflective Learning completed the learning process by encouraging participants to evaluate their own preparedness as future entrepreneurial teachers. Reflection enabled participants to consider how the concepts presented during the seminar could influence their professional identities, instructional approaches, and future relationships with students and communities. The overall learning design therefore followed a participatory sequence in which participants received conceptual input, analyzed situations, exchanged ideas, presented responses, received feedback, and reflected on possible applications.

The three main thematic presentations complemented these methods. The first focused on entrepreneurial mindset as an essential competency for twenty-first-century teachers and emphasized the transition from teacher-centered education toward innovation-centered learning. The second addressed strategies for embedding entrepreneurial values into learning through creative learning, project-based learning, problem-based learning, and the development of critical thinking, creativity, communication, collaboration, and leadership. The third addressed educational innovation and social entrepreneurship, emphasizing how teachers can build cultures of innovation, utilize school environments as learning resources, and develop educational projects that provide benefits to wider communities.

3. Implementation and Evaluation Procedures

The implementation proceeded through a structured sequence beginning with preparation and continuing through seminar delivery, discussion, reflection, evaluation, reporting, and potential follow-up collaboration. During the preparation stage, the organizing team coordinated with institutional partners, identified participant needs, developed instructional materials, assigned speaker responsibilities, and prepared evaluation instruments. These activities established the operational foundation for the seminar and ensured that the program was aligned with its intended objectives.

The main seminar stage consisted of interactive presentations delivered by three speakers, followed by discussion and case-based activities. Rather than treating the presentations as an endpoint, the program used them as an entry point for deeper participant engagement. Following the delivery of the materials, participants worked in groups to discuss educational cases and identify practical strategies for developing creativity, leadership, problem-solving, initiative, and entrepreneurial attitudes among learners. Group outputs were subsequently presented and discussed, allowing speakers to provide feedback and reinforce important concepts.

Evaluation was conducted formatively through observation of participant engagement during the seminar, discussions, and question-and-answer sessions. Participants also completed evaluation instruments intended to assess their understanding of the material and their perceptions concerning the importance of entrepreneurial mindset for future teachers. The evaluation focused on four principal indicators: understanding of entrepreneurial

mindset, ability to identify opportunities for innovation in learning, readiness to integrate entrepreneurial values into teaching, and commitment to becoming innovative and adaptive teachers in response to technological developments.

The evaluation design emphasized observable learning responses rather than relying exclusively on theoretical knowledge. Active participation, questions, contributions during group discussions, and the ability to relate seminar content to educational contexts provided qualitative indications of participant engagement. The participants demonstrated enthusiasm throughout the activities and were able to connect the presented concepts with their own educational experiences and prospective professional responsibilities.

The implementation also incorporated a broader follow-up perspective. The program was designed to support continued international academic collaboration and future activities involving seminars, training, joint research, and community service. Consequently, the activity was not conceptualized as an isolated intervention but as an initial platform for strengthening cooperation between participating institutions and expanding opportunities for sustainable development of entrepreneurial competencies among future educators.

Overall, the methodological design combined structured preparation, participatory learning, experiential engagement, collaborative problem-solving, reflection, and formative evaluation. This approach enabled the community service program to move beyond one-directional knowledge dissemination and toward a learning process in which pre-service teachers could interpret, discuss, and contextualize entrepreneurial principles within their future professional roles. The methodology therefore provided an appropriate foundation for developing entrepreneurial mindset and innovation skills while simultaneously strengthening international academic engagement and the broader community empowerment objectives of the program.

RESULTS

1. Engagement during the Entrepreneurship Seminar

The entrepreneurship seminar at Universiti Tun Hussein Onn Malaysia (UTHM) generated a high level of participant engagement throughout the learning activities. Engagement was visible through active participation in presentations, group discussions, question-and-answer sessions, case analysis, and group presentations. Rather than remaining passive recipients of information, the pre-service teachers interacted with the speakers and peers to relate entrepreneurial concepts to educational situations. This pattern was particularly evident during the discussion sessions, when participants actively explored how teachers could cultivate entrepreneurial characteristics among students. The findings suggest that the seminar format successfully created an environment in which participants were willing to exchange perspectives and engage with unfamiliar ideas. Such engagement is consistent with evidence that challenge-based learning can strengthen students' involvement by placing them in situations that require active responses to meaningful problems rather than passive absorption of theoretical information (Berginc et al., 2023).

The participatory character of the seminar was also reflected in participants' responses to the practical orientation of the materials. The three presentations introduced entrepreneurial mindset,

innovative learning strategies, and social entrepreneurship from complementary perspectives, allowing participants to see connections between entrepreneurship and their prospective teaching responsibilities. The subsequent case-based discussions provided opportunities to test these ideas against realistic educational challenges. Participants were encouraged to identify characteristics required of twenty-first-century teachers, strategies for stimulating student creativity, appropriate uses of digital technology, and possible innovations within schools. This structure encouraged participants to move between conceptual understanding and practical interpretation. The result is important because engagement in teacher education is strengthened when learning activities are connected with authentic professional contexts and innovative pedagogical experiences (Nair, 2025).

Participant engagement was further supported by the social and interpersonal environment created during the seminar. The group-based format enabled pre-service teachers to communicate their perspectives, listen to alternative interpretations, and develop responses collectively. The observation of active questioning and discussion indicates that participants perceived the seminar as sufficiently relevant to their professional preparation to warrant sustained involvement. Engagement in this context was therefore not limited to physical attendance but was manifested through cognitive and social participation. Supportive learning environments are particularly important for pre-service teachers because interaction with peers and educators can influence their willingness to participate, persistence in learning activities, and positive emotional experiences. The findings correspond with research demonstrating the importance of teacher and peer support in strengthening engagement among pre-service teachers (Fan et al., 2024).

Another important outcome concerned the relationship between engagement and the community-oriented dimension of the seminar. Discussions did not restrict entrepreneurship to personal economic achievement but introduced participants to social entrepreneurship and the possibility of using education to address community needs. Participants were encouraged to consider how teachers could develop projects that benefit school communities and wider society. This perspective gave the seminar a broader purpose and connected entrepreneurial learning with social responsibility. The participants' ability to relate the seminar themes to educational and community contexts indicates that engagement was strengthened when entrepreneurship was presented as a mechanism for creating educational and social value. Community engagement has similarly been associated with the development of important twenty-first-century competencies among pre-service and in-service teachers, particularly communication, collaboration, creativity, and critical thinking (Alarabi et al., 2025).

2. Emerging Entrepreneurial Mindset among Participants

The activities indicated an emerging shift in participants' understanding of entrepreneurship from a business-centered concept toward a broader professional mindset. Throughout the seminar, entrepreneurship was framed as the capacity to identify opportunities, take initiative, generate solutions, adapt to change, and create value. This reframing was particularly relevant for pre-service teachers because it positioned entrepreneurial thinking within teaching rather than outside the profession. Participants were encouraged to view teachers as opportunity creators, innovators, facilitators, and agents of change. Their responses

during discussions suggested growing recognition that entrepreneurial characteristics can be incorporated into ordinary educational practice. This finding corresponds with evidence that entrepreneurship learning can influence entrepreneurial mindset through changes in attitudes and self-efficacy, suggesting that educational experiences can shape how learners perceive their own capacity to act entrepreneurially (Pringgabayu et al., 2025).

The emergence of entrepreneurial thinking was also reflected in participants' ability to identify opportunities for innovation in teaching. During case discussions, they explored alternative strategies for developing creativity, problem-solving, collaboration, leadership, and student independence. These responses indicate that participants were beginning to interpret educational challenges as opportunities for developing new approaches rather than merely as constraints. Such a shift represents an important component of entrepreneurial thinking because it involves moving from recognition of a problem toward consideration of possible action. Evidence involving pre-service primary school teachers similarly demonstrates that entrepreneurship-oriented educational experiences can contribute to the development of entrepreneurial thinking, particularly when participants are given opportunities to connect entrepreneurial concepts with their future professional roles.

The seminar also appeared to strengthen participants' awareness of the importance of adaptability and initiative in contemporary teaching. Discussions concerning digital transformation and artificial intelligence encouraged participants to consider how technological developments could be used responsibly to improve learning. Rather than treating technology as an end in itself, participants were encouraged to evaluate opportunities, consider ethical implications, and identify appropriate educational applications. This reflects an entrepreneurial orientation in which innovation requires not only generating ideas but also evaluating their relevance and potential consequences. The emergence of this perspective is consistent with research indicating that entrepreneurial mindset among university students is influenced by entrepreneurship education, entrepreneurial inspiration, learning methods, and the surrounding educational environment (Shiri et al., 2025).

The presence of multiple speakers and examples from different professional perspectives also contributed to participants' exposure to entrepreneurial role models. The speakers demonstrated how entrepreneurial principles could be interpreted through teacher leadership, creative pedagogy, innovation, and social entrepreneurship. This broadened the participants' understanding of what an entrepreneurial educator could look like. Instead of presenting entrepreneurship as a distant career pathway, the seminar made it visible through professional practices relevant to their future occupations. Such contextualization is important because entrepreneurial development can be influenced by educational experiences and exposure to role models, which help learners recognize possible entrepreneurial behaviors and identities within their own circumstances (Alkaabi & Senghore, 2024).

3. Innovation Skills and Community-Oriented Learning

The seminar contributed to the development of innovation-related skills by requiring participants to analyze educational problems and formulate possible responses collaboratively. Case-based activities encouraged them to identify problems, generate alternatives, evaluate possible strategies, and communicate their ideas to others.

These activities addressed several competencies relevant to innovative teaching, including critical thinking, problem-solving, communication, teamwork, and initiative. Although the activity was primarily a seminar rather than an extended innovation project, the learning process provided participants with an initial opportunity to practice these competencies within an educational context. This outcome is consistent with recent evidence showing that critical thinking, problem-solving, and teamwork play important roles in practical innovation among pre-service vocational teachers.

Participants' exposure to project-based learning and problem-based learning further strengthened the practical orientation of the program. These approaches were presented as mechanisms through which teachers can encourage students to investigate problems, collaborate, develop ideas, and construct solutions. The participants' strong interest in these approaches suggests that they recognized their relevance to contemporary teaching practice. The seminar consequently provided more than conceptual information about innovation; it introduced pedagogical strategies through which future teachers could potentially facilitate innovative behavior among their own students. This orientation corresponds with research showing that flexible learning experiences can support pre-service teachers' ability to design innovative teaching practices and adapt instructional approaches to changing learning environments (Vetsawat & Nuangchalem, 2026).

The community-oriented dimension of the seminar extended innovation beyond classroom technique. Participants were introduced to social entrepreneurship and encouraged to consider how educational projects could generate benefits for school communities and society. This perspective positioned innovation as a means of addressing meaningful needs rather than simply producing something novel. The combination of entrepreneurship, innovation, and community empowerment therefore encouraged participants to connect professional competence with social contribution. Experiential learning grounded in local or community-related contexts can be particularly valuable for developing creative thinking because it allows pre-service teachers to connect abstract concepts with situations that have social and cultural meaning (Widyastuti et al., 2026).

Overall, the results indicate that the seminar created an initial foundation for integrating entrepreneurial mindset, innovation, and community-oriented learning into pre-service teacher development. The strongest evidence was found in participants' active engagement, their growing recognition of entrepreneurship as a professional mindset, their ability to identify possibilities for educational innovation, and their consideration of community-oriented applications. The program did not seek to establish that a single seminar could permanently transform entrepreneurial competence; rather, its contribution lies in initiating awareness, stimulating reflection, and providing participants with practical conceptual tools for future application. The combination of interactive learning, case analysis, collaborative discussion, and reflection thus represents a promising starting point for longer-term teacher development programs focused on entrepreneurial and innovative educational practice.

DISCUSSION

1. Reframing Entrepreneurship for Pre-Service Teachers

The findings of this community service program suggest that entrepreneurship should be reframed as a broader educational capability rather than being confined to business establishment or commercial activity. For pre-service teachers, an entrepreneurial mindset involves recognizing opportunities, initiating improvements, generating solutions, and creating educational and social value. This broader interpretation is particularly relevant because teachers operate in environments where conventional instructional approaches may not adequately respond to changing learner needs. The seminar therefore positioned entrepreneurship as part of professional teacher development, allowing participants to consider how entrepreneurial thinking could influence classroom practices, school initiatives, and relationships with communities. Such an orientation is consistent with sustainability-oriented entrepreneurship education, which encourages learners to connect entrepreneurial action with broader economic, environmental, and social considerations (Bragelien & Voldsund, 2024).

The reframing of entrepreneurship also changes the expected outcomes of teacher preparation. Instead of measuring entrepreneurial learning primarily through business intentions, teacher education can emphasize initiative, creativity, responsible decision-making, opportunity recognition, and the capacity to generate meaningful solutions. These capabilities are particularly relevant for future teachers because educational challenges frequently require responses that are simultaneously pedagogical and social. The seminar's emphasis on social entrepreneurship consequently provided a useful bridge between entrepreneurial thinking and community empowerment. Participants were encouraged to consider how educational projects could respond to problems within schools and surrounding communities, thereby positioning teachers as contributors to sustainable development rather than merely implementers of predetermined curricula. Sustainable entrepreneurship education similarly emphasizes the integration of entrepreneurial competencies with awareness of social and environmental consequences (La Rubia et al., 2022).

This perspective further implies that entrepreneurial learning should not be isolated within a single entrepreneurship course. Pre-service teachers can encounter entrepreneurial principles through pedagogical design, project development, community engagement, educational technology, and collaborative problem-solving. Such integration requires connections among universities, schools, communities, and other external stakeholders. The findings from the UTHM seminar support this direction because entrepreneurship was presented through multiple pedagogical and professional perspectives rather than as a standalone commercial subject. Collaboration with external actors can provide access to authentic problems and complementary expertise, allowing entrepreneurial education to become more contextualized. Recent research on university-industry collaboration similarly emphasizes the importance of external partnerships for developing sustainable entrepreneurship and connecting academic knowledge with broader innovation ecosystems (Izharuddin, 2026).

2. Experiential Learning as a Catalyst for Innovation Skills

The participatory structure of the seminar demonstrates the value of experiential learning in developing innovation-oriented competencies among pre-service teachers. Participants were not simply introduced to definitions of entrepreneurial mindset; they were required to discuss cases, interpret educational challenges, exchange ideas, and formulate potential solutions. This process

created opportunities for participants to connect conceptual knowledge with practical situations. Innovation skills emerge more meaningfully when learners must work with problems that lack predetermined answers. For future teachers, such experiences are particularly important because classroom innovation requires the ability to diagnose learning problems, consider alternatives, and adapt strategies according to contextual conditions. Evidence from pre-service teacher education indicates that experiential learning can support the development of reasoning and the ability to establish meaningful connections between concepts and practical learning situations (Suanto et al., 2026).

The case-based discussion component also demonstrated how experiential learning can strengthen problem-solving and collaborative thinking. Participants were asked to identify the characteristics of twenty-first-century teachers, propose strategies for cultivating creativity among students, consider ethical uses of digital technology, and formulate innovations applicable to school environments. These tasks required participants to move beyond recalling information toward interpretation, evaluation, and application. Such processes are central to innovation because ideas must emerge from an understanding of problems and be translated into feasible responses. Project-based and experiential approaches have similarly been shown to provide pre-service teachers with learning environments in which theoretical knowledge can be applied to authentic educational tasks, strengthening the relationship between academic preparation and professional practice (Poonputta, 2023).

Experiential learning is particularly valuable when it incorporates reflection. In the present program, group presentations were followed by feedback from the speakers, allowing participants to reconsider their assumptions and refine their proposed solutions. Reflection transformed the seminar from a sequence of activities into a process of meaning-making. Participants could evaluate their own readiness to become innovative teachers and identify ways entrepreneurial values might be incorporated into future teaching. This reflective dimension is important because innovation requires not only generating ideas but also evaluating their relevance, limitations, and potential consequences. Research on experiential learning in teacher education similarly emphasizes the need to connect theoretical knowledge with practical experience through structured reflection and pedagogical adaptation (Setiono et al., 2026).

The community-oriented dimension of experiential learning further expands the meaning of innovation. When future teachers work with problems connected to communities, innovation becomes associated with responsiveness and social relevance rather than novelty alone (Indriani et al., 2026). In this program, the introduction of social entrepreneurship encouraged participants to consider how school-based projects could generate benefits for students, schools, and surrounding communities (Saputra et al., 2026). Such an approach can help future teachers recognize that educational innovation should respond to actual needs and involve relevant stakeholders (Murti et al., 2026). Experiential learning can therefore provide a bridge between professional competence and social responsibility. Research on experiential approaches similarly demonstrates that practical learning environments can stimulate higher-order thinking by requiring learners to apply knowledge to situations involving uncertainty, experimentation, and problem-solving (Habib et al., 2021).

3. International Collaboration and Sustainable Teacher Development

The international character of the UTHM program added an important dimension to teacher development by exposing participants to educational perspectives beyond their immediate institutional environment. Collaboration between Indonesian and Malaysian academic actors created opportunities for knowledge exchange and professional interaction across national contexts (Permana et al., 2026). Such exposure is valuable because educational innovation is shaped by cultural, institutional, technological, and social circumstances (Hernita et al., 2026). Pre-service teachers who encounter different perspectives may become more capable of questioning assumptions and considering alternative approaches to teaching (Cholifah et al., 2026). International collaboration can consequently contribute to professional flexibility by encouraging participants to interpret educational challenges from multiple perspectives rather than relying exclusively on familiar practices (Sihotang, Suhud, Handaru, 2025b).

Sustainable teacher development, however, requires collaboration to extend beyond a single seminar. International activities become more valuable when they establish relationships that support continuing professional learning, shared projects, mentoring, research, and subsequent community engagement. The current program already provides a foundation for such continuity through collaboration among UNJ, UTHM, and KDMI. Sustained collaboration can create opportunities for educators to exchange practices, jointly develop learning materials, and evaluate innovations after their initial implementation (Merina, Suhud, Sihotang, et al., 2026b). Research on professional development demonstrates that teacher collaboration is influenced by organizational conditions and opportunities for sustained interaction, indicating that meaningful professional learning requires structures that allow collaboration to continue beyond isolated events (Díaz-Sacco & Muñoz-Salinas, 2025).

The program can therefore be interpreted as an initial intervention within a broader ecosystem of teacher professional development. Future initiatives could transform seminar concepts into collaborative projects in which pre-service teachers design entrepreneurial learning activities, implement community-oriented projects, and reflect on their outcomes with peers and international mentors (Merina, Suhud, Sihotang, et al., 2026). Such continuity would strengthen the connection between entrepreneurial mindset and actual professional practice (Pertiwi et al., 2026). Experiential activities that extend beyond conventional classrooms can provide learners with opportunities to observe real contexts, make decisions, and evaluate consequences, thereby enriching professional preparation (Sihotang et al., 2025). This principle is supported by recent research demonstrating the potential of experiential learning outside conventional classroom environments to deepen applied learning and connect academic knowledge with practical experience (Chopra, 2025).

Overall, the discussion indicates that the contribution of the UTHM community service program extends across three interconnected dimensions: redefining entrepreneurship as a professional and socially oriented capability, using experiential learning to cultivate innovation skills, and establishing international collaboration as a foundation for continued teacher development (Wibowo et al., 2026). These dimensions reinforce one another. A broader conception of entrepreneurship provides the purpose for

innovation; experiential learning provides the mechanism for transforming that purpose into competence; and international collaboration provides a wider environment for sustaining professional growth. The program therefore represents more than a seminar-based transfer of knowledge (Sihotang & Hidir, 2022). It offers an initial model for developing pre-service teachers who can recognize educational opportunities, design context-sensitive innovations, collaborate across institutional boundaries, and contribute to communities through entrepreneurial and socially responsible educational practice (Sihotang, Suhud, Handaru, 2025a).

CONCLUSION

1. Key Outcomes of the Community Service Program

The community service program at Universiti Tun Hussein Onn Malaysia (UTHM) demonstrated the relevance of entrepreneurship and innovation education in preparing pre-service teachers for the demands of contemporary education (Sihotang et al., 2025). Through the international seminar on “Entrepreneurship, Innovation, and Community Empowerment,” participants were introduced to entrepreneurial mindset as a professional orientation rather than merely a business-oriented capability (Ilhamalimy et al., 2025). The activities enabled participants to understand the importance of creativity, initiative, adaptability, opportunity recognition, leadership, and problem-solving within the teaching profession (Suhud, Unarto, Sugianto Sihotang, et al., 2026).

The program also generated active engagement through interactive presentations, case-based discussions, group activities, presentations, and reflection (Suhud, Sihotang, Boonkaew, et al., 2026). Participants demonstrated enthusiasm in discussing educational challenges and identifying possible innovations for classroom and school environments (Sihotang, Suhud, Handaru, et al., 2026). The activities encouraged them to connect entrepreneurial concepts with their prospective professional responsibilities. In particular, the discussion of project-based learning, problem-based learning, experiential learning, digital technology, and social entrepreneurship helped participants recognize practical ways to develop innovative learning environments (Sihotang, Suhud, Handaru, et al., 2027).

Another important outcome was the strengthening of participants’ awareness of the teacher’s role as an innovator and change agent. Entrepreneurship was presented as a means of creating educational and social value rather than simply generating financial returns (Suhud, Nair, Chee Hoo, et al., 2026). This perspective encouraged participants to consider how teachers can respond creatively to educational challenges and contribute to community development (Suhud, Wolor, Sulistyowati, et al., 2025). The international collaboration between UNJ, UTHM, and KDMI also created opportunities for academic exchange and demonstrated the potential of cross-institutional cooperation in strengthening teacher education (Suhud, Sihotang, Chanthawong, et al., 2026).

2. Implications for Teacher Education

The findings have important implications for the preparation of future teachers. Entrepreneurial mindset should be considered as a complementary dimension of teacher professionalism alongside pedagogical, technological, and disciplinary competencies. Teachers increasingly operate in environments characterized by rapid technological development, changing learner expectations, and complex social challenges (Suhud, Sihotang, Juliana, et al.,

2026). Consequently, teacher education programs need to provide opportunities for pre-service teachers to develop the confidence and capacity to initiate ideas, solve problems, collaborate with others, and adapt their teaching practices (Suhud, Sihotang, Allan, et al., 2026).

Entrepreneurial learning should also be embedded across teacher education rather than being restricted to specific entrepreneurship courses or seminars. Project-based learning, problem-based learning, experiential learning, social entrepreneurship, and community-based activities can provide practical environments in which entrepreneurial competencies are developed (Sihotang, Suhud, Reztrianti, et al., 2027). Such approaches allow pre-service teachers to experience the processes of identifying problems, generating solutions, implementing ideas, receiving feedback, and reflecting on outcomes (Suhud, Boonkaew, Sihotang, et al., 2025).

The program further indicates the importance of connecting teacher education with community needs. Future teachers should be prepared not only to manage classroom learning but also to recognize opportunities for educational and social improvement within their surrounding communities (Suhud, Allan, Hoo, et al., 2026). This broader professional role can strengthen the capacity of teachers to become innovators, learning leaders, and agents of positive change (Sihotang, Suhud, Handaru, et al., 2027).

3. Future Directions

Future community service programs should move beyond the seminar format toward more sustained and practice-oriented activities (Sihotang, 2027). Follow-up programs could involve workshops, mentoring, project-based entrepreneurship activities, social entrepreneurship initiatives, and community-based educational projects. Such activities would allow participants to transform the knowledge and awareness gained during the seminar into concrete practices (Suhud, Caniago, Sihotang, et al., 2026).

The collaboration between UNJ, UTHM, and KDMI also provides a foundation for developing longer-term international programs. Future cooperation could include joint training, collaborative research, student exchanges, innovation projects, and subsequent community service activities focusing on teacher development and educational entrepreneurship (Cholifah et al., 2027). These initiatives could create a continuous learning network involving educators, pre-service teachers, institutions, and communities (Suhud, Caniago, Sihotang, et al., 2026).

Finally, future programs should incorporate more systematic assessment of learning outcomes. Pre- and post-program assessments, participant reflections, project evaluations, and follow-up observations could provide stronger evidence of changes in entrepreneurial mindset and innovation skills (Sihotang, Suhud, Handaru, et al., 2027). Such evaluation would help determine whether short-term learning experiences lead to sustained changes in professional attitudes and practices (Sihotang et al., 2027). Overall, the program provides a meaningful starting point for developing entrepreneurial and innovative future teachers while establishing a foundation for continued international collaboration and community empowerment (Sihotang, 2026).

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