



Enhancing Entrepreneurship Skills in MAN 5 Agam Students through a Studentpreneurship Program

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ABSTRACT

The evolving era of the Industrial Revolution 4.0 demands that individuals possess a diverse range of skills, including entrepreneurship. However, students at MAN 5 Agam still lack entrepreneurial skills, as they tend to prioritize religiosity over practical skills. To address this issue, this study aims to integrate religious education with entrepreneurial skills through the studentpreneurship program, preparing students for the challenges of the Industrial Revolution 4.0. The objectives of this study are: (1) to explore the implementation of the studentpreneurship program at MAN 5 Agam, conducted annually, and (2) to assess the improvement of students' entrepreneurial character through this program in response to the Industrial Revolution 4.0. This research employs a qualitative method with a phenomenological approach and a case study design. Data were collected through in-depth observation and documentation analysis. The results indicate that the studentpreneurship program has been successfully implemented, leading to a positive impact on students, including the development of an entrepreneurial mindset through the creation of products such as satay, bread, and traditional pastries. These entrepreneurial skills not only contribute to students' personal development but also equip them with the competencies necessary to compete in the evolving job market of the Industrial Revolution 4.0.

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ABSTRAK

Era Revolusi Industri 4.0 yang terus berkembang menuntut individu untuk memiliki berbagai keterampilan, termasuk kewirausahaan. Namun, siswa di MAN 5 Agam masih kurang memiliki keterampilan kewirausahaan, karena mereka cenderung lebih memprioritaskan religiusitas dibandingkan keterampilan praktis. Untuk mengatasi masalah ini, penelitian ini bertujuan untuk mengintegrasikan pendidikan agama dengan keterampilan kewirausahaan melalui program *studentpreneurship*, guna mempersiapkan siswa menghadapi tantangan Revolusi Industri 4.0. Tujuan dari penelitian ini adalah: (1) mengeksplorasi implementasi program *studentpreneurship* di MAN 5 Agam yang dilaksanakan setiap tahun, dan (2) menilai peningkatan karakter kewirausahaan siswa melalui program ini sebagai respons terhadap Revolusi Industri 4.0. Penelitian ini menggunakan metode kualitatif dengan pendekatan fenomenologis dan desain studi kasus. Data dikumpulkan melalui observasi mendalam dan analisis dokumentasi. Hasil penelitian menunjukkan bahwa program *studentpreneurship* telah berhasil diimplementasikan, memberikan dampak positif pada siswa, termasuk pengembangan pola pikir kewirausahaan melalui pembuatan produk seperti sate, roti, dan kue tradisional. Keterampilan kewirausahaan ini tidak hanya berkontribusi pada pengembangan pribadi siswa, tetapi juga membekali mereka dengan kompetensi yang diperlukan untuk bersaing di pasar kerja yang terus berkembang pada era Revolusi Industri 4.0.

KATA KUNCI

Pendidikan,
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MAdrasah Aliyah,
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Introduction

In the era of the Industrial Revolution 4.0, education has undergone significant transformation, particularly in the development of entrepreneurial skills. This era is marked by rapid technological advancements that integrate sophisticated technologies into entrepreneurial activities, emphasizing creativity and innovation in the entrepreneurial process (Jumali et al., 2024). Educational approaches must transition from traditional methods to innovative strategies that address global dynamics (Kaya-Capocci, 2022). These strategies should foster technical skills and 21st-century competencies—critical thinking, creativity, communication, and collaboration—essential for entrepreneurial success in a complex business environment (Yondri et al., 2020).

Entrepreneurial success in the Industrial Revolution 4.0 era hinges on an individual's ability to identify and leverage local resources, ideas, and skills. This capability not only provides a competitive edge but also fosters sustainable economic growth at local and global levels (Sheik & Kader, 2022). The Industrial Revolution 4.0 necessitates a shift in education, urging a re-evaluation of traditional teaching to meet digital era demands (Oke & Fernandes, 2020). Teachers now facilitate learning by integrating technology, particularly in STEM education, to prepare students for future work. Blended learning, combining in-person and online methods, equips students with technical, critical, and creative skills for innovation in a dynamic world (Naidoo & Singh-Pillay, 2020).

Beyond technical preparation, the Industrial Revolution 4.0 calls for changes in classroom environments to support sustainability and social justice. Classrooms need to be restructured to create inclusive, holistic learning spaces that prepare students as socially conscious entrepreneurs capable of addressing global challenges like climate change, social injustice, and economic inequality through innovative solutions (Moloi & Matabane, 2020). The integration of entrepreneurial education into curricula is thus vital. Entrepreneurship, a multidimensional competency, is recognized as a critical theme in 21st-century education (Fadel et al., 2015). Tools like the Collaborative Instructional Design System enable teachers to integrate entrepreneurial elements into their teaching plans (Zain, 2017).

Moreover, the Industrial Revolution 4.0 underscores the importance of early character development. Traits such as responsibility, emotional intelligence, and integrity are crucial in a world reshaped by technology and globalization (Ahyani, 2021). Character education must adopt a holistic approach, focusing on cognitive aspects and soft skills that enable effective interaction, critical thinking, and ethical action in diverse situations. Cultivating creativity and innovation from an early age equips individuals with adaptability to navigate a rapidly changing entrepreneurial landscape. Learning methods that emphasize experimentation, problem-solving, and collaboration nurture critical and creative thinking skills naturally.

The integration of digital tools and robotics in education further enhances inclusivity and supports sustainable solutions, especially for students with special needs (Zamin et al., 2018). These technologies create adaptive learning environments tailored to individual needs, fostering an inclusive system where all students have equal opportunities to realize their potential. The use of technology in education also fosters digital literacy—a prerequisite for success in various fields. Through smart technology integration, students learn to apply digital tools to solve real-world problems, innovate, and create value, preparing them to thrive in a technology-driven future.

Madrasahs are unparalleled in their ability to develop young individuals with strong character and entrepreneurial mindsets by blending religious values with science. A foundation in religious values combined with professional skills forms the basis for "professional-religious" individuals who can compete globally without compromising their spiritual identity (Saridudin & Ta'rif, 2021). Early entrepreneurial character education in Madrasahs instills qualities such as risk-taking, innovation, creativity, and determination, preparing students to face real-world challenges confidently (Badawi, 2024). This approach produces successful entrepreneurs and shapes individuals with high work ethics, integrity, and moral commitment.

The integration of entrepreneurship education into the Madrasah curriculum is a response to the need for students to adapt to the rapidly evolving economic landscape. Madrasah graduates possess a strong foundation in entrepreneurial character, which equips them with the mental readiness and skills to thrive in competitive markets (Yusuf, 2023). This initiative encompasses more than job creation; it also empowers individuals as agents of societal change. Furthermore, entrepreneurship education in Madrasahs supports financial sustainability through self-funding mechanisms. The development of sustainable business models by Madrasahs enhances their financial independence, thereby improving educational opportunities for students (Kriswahyudi et al., 2024). In this context, Madrasah Principals play a pivotal role in fostering a business-oriented mindset among teachers and students while integrating ethical and cultural values into entrepreneurship programs. These programs must reflect the moral principles of Islamic teachings, ensuring that business practices align with ethical standards (Hidayati et al., 2023).

Research on vocational Madrasahs has demonstrated the distinctive role of religious

values in shaping students' entrepreneurial character, thereby ensuring ethical business practices that are in alignment with Islamic teachings (Tuti Kamila Sukma et al., 2023). The integration of cultural, religious, and entrepreneurial education fosters the development of graduates who possess both intellectual aptitude and moral responsibility, embodying a holistic value system. Initiatives such as student entrepreneurship programs further bolster entrepreneurial development in Madrasahs. These programs have been shown to enhance students' independence and entrepreneurial skills, enabling them to succeed in the workforce and business world (Ibda et al., 2024). By examining job market demands, such as through platforms like Indeed, students can align their skills with emerging market needs (Lasut et al., 2022).

The student entrepreneurship program in madrasahs has been identified as an effective strategy for equipping students with entrepreneurial skills and an understanding of labor market dynamics. It has been demonstrated to cultivate creativity, critical thinking, and problem-solving skills, thereby transforming students into independent and innovative individuals who are well-equipped to tackle future challenges. This approach ensures that madrasah education integrates religious values with practical skills, enabling students to become agents of change in their communities. However, challenges such as inconsistent management commitment, traditional practices, limited resources, and disparities between public and private madrasahs hinder its success. (Sadri et al., 2020; Syaifudin, 2021; Mansur et al., 2023).

Efforts to address these challenges include the promotion of equitable support through cross-subsidization and community involvement, which play a crucial role in improving program implementation and education quality (Kultsum et al., 2022). Teacherpreneurship, defined as the integration of entrepreneurial principles and practices into the educational sector, is a complementary strategy that aims to empower educators to adopt an entrepreneurial mindset. This approach fosters student creativity and resilience while innovating educational practices (Chaker & Dellagi, 2023; De Carolis & Litzky, 2019).

Furthermore, the concept of teacherpreneurship aligns with the idea of moving away from teacher-led entrepreneurship education towards a more student-centered approach that emphasizes experiential and lifelong learning practices (Robinson et al., 2016). Teachers who adopt this entrepreneurial spirit are not merely involved in teaching entrepreneurship, but they also engage in entrepreneurial activities, thereby enhancing students' comprehension and practical application of entrepreneurial concepts (Chaker & Jarraya, 2021).

Furthermore, the cultivation of an entrepreneurial mindset in primary education, facilitated by teachers employing innovative methods such as design thinking, underscores the efficacy of teacher-led initiatives in fostering entrepreneurial thinking from a young age (Zupan et al., 2018). This underscores the importance of teachers in instilling an entrepreneurial spirit in students early on, contributing to the nurturing of future innovators and change-makers.

In essence, teacherpreneurship signifies the integration of entrepreneurial endeavors within the domain of education by educators. These activities include the development and commercialization of educational products, the utilization of contemporary technology to catalyze innovation within the classroom environment, and the dissemination of resources and knowledge through digital platforms that have the potential to generate financial returns (Gunasekara et al., 2023; Shelton, 2019). Furthermore, the concept encompasses the notion that teachers should be willing to assume risks, demonstrate strong leadership skills, and create innovative and dynamic learning environments to promote student growth and success (Hassona et al., 2023).

Teacherpreneurship is a pedagogical approach that entails a shift from teacher-led to student-centered entrepreneurship education, placing emphasis on lifelong learning (Robinson et al., 2016). Teacher-entrepreneurs instruct students on the subject of entrepreneurship, facilitating the enhancement of students' comprehension and practical application of entrepreneurial concepts (Chaker & Jarraya, 2021). Innovative methods, such as design thinking in primary education, underscore the efficacy of teacher-led initiatives in cultivating early entrepreneurial thinking (Zupan et al., 2018).

In the domain of education, the concepts of teacherpreneurship and studentpreneurship hold particular significance in fostering an entrepreneurial spirit among educators and students alike. Teacherpreneurs are defined as innovators who create educational products, thereby transforming learning practices. Concurrently, studentpreneurs engage in entrepreneurial activities, applying business concepts and developing skills relevant to contemporary labor markets. Tresna Gumelar et al. (2023) and Mohamed Fadzil et al. (2022) have underscored the significance of these models in fostering character development and equipping students with the competencies necessary to initiate and manage their own enterprises.

Timan et al. (2024) emphasized, targeted education is instrumental in helping students develop a comprehensive understanding of the intricacies and opportunities inherent in entrepreneurship. Sulistyowati (2023) noted that entrepreneurship education offers various career paths and enhances entrepreneurial knowledge and skills. Chaker & Dellagi (2023) reiterated the significance of entrepreneurship education in cultivating competencies and mindsets. In contrast, Shofwan et al. (2023) and Boldureanu et al. (2020) underscored the role of practical experiences and role models in nurturing entrepreneurial spirit among students.

In the contemporary era of the Industrial Revolution 4.0, the possession of technological aptitude and the utilization of digital media have become paramount for students seeking to compete in a progressively intricate and technology-driven global labor market. In addition to technical aptitude, soft skills such as religiosity, responsibility, honesty, and loyalty are highly regarded by stakeholders in the business world (Ahmad & Ma'rifatani, 2022). This underscores the notion that character education remains an indispensable component that must be inculcated from an early stage within the educational environment.

At MAN 5 Agam, the student entrepreneurship program, exemplified by activities such as Entrepreneur Day, integrates entrepreneurship education into the curriculum. This initiative is designed to foster the development of entrepreneurial character and skills that are aligned with Islamic principles, thereby preparing students to navigate the challenges of the Industrial Revolution 4.0 era. By integrating academic knowledge, ethical values, and practical experience, the program aims to nurture future innovators who contribute positively to society. Therefore, this study focuses on analyzing the implementation of the studentpreneurship program at MAN 5 Agam and evaluating its effectiveness in enhancing students' entrepreneurial character and skills to better prepare them for the demands of the Industrial Revolution 4.0.

Methods

This study uses a qualitative method with a phenomenological approach, which was chosen as it is suitable to explore students' experiences and perceptions regarding the implementation of entrepreneurship programmes at Madrasah Aliyah level. The phenomenological approach allows researchers to explore the subjective meanings that students associate with their involvement in entrepreneurship programmes. This method

aims to understand the essence of students' experiences, focusing on how they interpret and give meaning to those experiences in the context of developing their entrepreneurial skills and leadership qualities. (Bagheri, 2011).

In addition, qualitative descriptive methods, including observation, interviews, and documentation, can be a tool to understand students' character development through educational programmes (Sulastri et al., 2023) Data collection was conducted through observation and documentation techniques during the activities. Observations were made using structured observation sheets to ensure the data collected was consistent and relevant. Documentation included activity notes, photos and videos taken during the programme.

The population in this study were all grade XI and XII students at MAN 5 Agam. The reason for choosing the research location at MAN 5 Agam is because most of the students come from families with middle to lower economic backgrounds. The research sample was purposively selected, consisting of 30 male students and 30 female students from various majors. The selection of this sample size was based on the need to obtain diverse perspectives from various educational backgrounds and genders.

The data collected were analysed using thematic analysis technique, where data were identified, analysed and reported in relevant themes. Each step in data collection and analysis was conducted with research ethics in mind, such as obtaining consent from participants, maintaining data confidentiality, and ensuring student participation was voluntary.

Results and Discussion

Results

The once-a-year studentpreneurship programme at MAN 5 Agam has been successfully implemented, achieving its core objectives effectively. This programme, an extension of a prior initiative, aims to cultivate an entrepreneurial spirit among students from an early age. In its execution, the programme does not merely focus on character development but also targets specific goals crucial for students' futures.

First, the programme introduces students to various types of businesses they can pursue post-graduation. By broadening their understanding of the business world, students are expected to recognize the opportunities around them and feel motivated to achieve success through entrepreneurship.

Second, the programme aims to spark students' interest in entrepreneurship. Engaging activities provide students with the opportunity to explore their interests in this field while developing essential skills for entrepreneurial success.

Third, the activities give students the option to either pursue higher education or choose entrepreneurship after graduation. By offering these choices, the programme helps students make informed decisions that align with their interests and talents.

Fourth, the programme plays a pivotal role in shaping students' characters, instilling values such as honesty, independence, and responsibility, which are crucial for entrepreneurial success and everyday life.

The programme not only prepares students for the increasingly complex job market of the Industrial Revolution 4.0 but also equips them with the skills and character to become productive and integrity-driven individuals in society (Kriswahyudi et al., 2024; Kusumaningrum et al., 2022; Niken Septantiningtyas & Sulistiawati, 2023; Zeng et al., 2023).

First Day Activities

The studentpreneurship activities at MAN 5 Agam spanned two days, involving different participants each day. On Monday, 30 January 2023, Grade 12 students from

Science, Social Studies, and Religious majors participated, aiming to equip them with entrepreneurial skills relevant to their futures.

In the implementation of this activity, the students were taught skills in making satay, bread, and traditional pastries. These three products were selected based on a market needs analysis that showed high demand. Satay, as one of Indonesia's popular traditional foods, has a wide appeal as both a main meal and a snack. Traditional breads and pastries are also in demand by various groups, ranging from children to adults, so they are considered as potential products to be used as business opportunities. The products produced by MAN 5 Agam students exhibit qualities that are not only delicious, but also competitive in the market, reflecting the skills and dedication they have developed during studentpreneurship activities.

The satay produced by the students is offered at an affordable price of around IDR 10,000 per serving, while the bread made is priced from IDR 2,000 per piece (see figures 1a and 1b). This pricing not only takes into account the cost of production, but also the purchasing power of the surrounding community and the potential to compete with similar products on the market.

The quality of the products made by students was competitive with market standards, demonstrating not just technical skills but also an understanding of the importance of quality control and innovation. This activity fostered a fun learning environment, encouraging students to continue developing their creativity and entrepreneurial skills.



Figure 1. Grade 12 Science students are in the process of making satay as part of studentpreneurship activities. (a) seasoning preparation, (b) meat preparation second panel.
(source: MAN 5 Agam's documentations)



Figure 2. Sale of food made by Year 12 social studies students
(source: MAN 5 Agam's documentations)

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In terms of marketing, students are encouraged to apply marketing strategies that are adaptive and relevant to current trends. Offline marketing is done through a simple bazaar that serves as a direct selling point, allowing direct interaction with consumers and creating a more personalised shopping experience. The bazaar can also be the centre of students' entrepreneurial activities, where they learn about marketing management, customer service, and stock and financial management (see figures 2a and 2b).

In addition, online marketing is an important element in expanding market reach. By utilising marketplace platforms such as Facebook and Instagram, student products can be sold to a wider audience, including beyond the local community. These platforms allow students to learn about digital marketing, social media account management, and how to build an attractive brand. They can utilise existing features on social media, such as paid advertising, promotion through influencers, and direct interaction with customers through comments or private messages.

Effective marketing strategies not only increase sales, but also give students real-world experience in the modern business world. They learn how to tailor products and prices to market demand, manage business operations efficiently, and understand the ever-changing market dynamics. Thus, this experience not only equips students with entrepreneurial skills, but also prepares them to become innovative and adaptive individuals in the digital age.

Second Day of Activities

On Tuesday, 31 January 2023, Grade 11 students participated in activities focused on making bread and traditional pastries. These products were chosen based on a market analysis indicating stable demand and a wide market share, making them ideal for building entrepreneurial skills. Bread, as one of the most popular food products among the public, is a practical snack enjoyed anytime and by consumers of all ages. From children to adults, bread remains a favorite due to its ease of serving and variety of flavors (see figures 3a and 3b). Through learning to produce bread, students gained not only technical knowledge of the production process but also an understanding of market dynamics and consumer preferences.

Traditional pastries were also selected for their rich flavors and cultural significance (see figures 4a and 4b). These pastries, beloved by the local community and tourists alike, reflect the local culinary heritage. Understanding the cultural and economic potential of traditional pastries allowed students to appreciate how cultural heritage can be leveraged to create profitable business opportunities. In this activity, students were encouraged to think creatively and innovate product variations that could attract a broader market. The emphasis was placed on maintaining high product quality, from raw material selection to production and packaging, to ensure competitiveness in the market.

To optimize learning and provide in-depth practical experience, students were divided into small groups of six. This arrangement enabled each student to engage more deeply in the production process, from selecting raw materials to the final presentation of the product. Through this hands-on approach, students gained a comprehensive understanding of each production stage and the importance of teamwork.

Beyond technical skills, students were also introduced to the importance of time management and production efficiency. These skills are invaluable in entrepreneurship,

where the ability to produce goods quickly and efficiently without compromising quality is critical. This experience provided students with insights into the challenges of the business world, such as effectively managing time, resources, and labor to achieve optimal results.

The products produced by MAN 5 Agam students, particularly the traditional breads and pastries, exhibited qualities that are not only delicious but also competitive in the market, reflecting the skills and dedication developed during these studentpreneurship activities. The bread made by students was priced affordably, starting from IDR 2,000 per piece, while the traditional pastries were similarly competitively priced, taking into account production costs, local purchasing power, and market competitiveness.

The positive reception from teachers and peers further validated the quality of these products and highlighted their potential for further development. This recognition not only instilled pride in the students but also motivated them to continue honing their skills and creativity. The hands-on experience, combined with the positive feedback, played a crucial role in building students' confidence and readiness to face future entrepreneurial challenges.

Overall, this activity underscored the importance of integrating entrepreneurship education into the school curriculum. Programs like this not only equip students with technical skills relevant to the job market but also foster critical thinking, time management, and innovation—key elements of entrepreneurship. Additionally, these activities helped students to better understand the practical application of theories learned in the classroom, reinforcing the relevance of formal education to the evolving needs of the market and the world of work. The studentpreneurship program at MAN 5 Agam thus prepares students not only for academic success but also for entrepreneurial success, enabling them to become creative, independent, and competitive young entrepreneurs in the future.

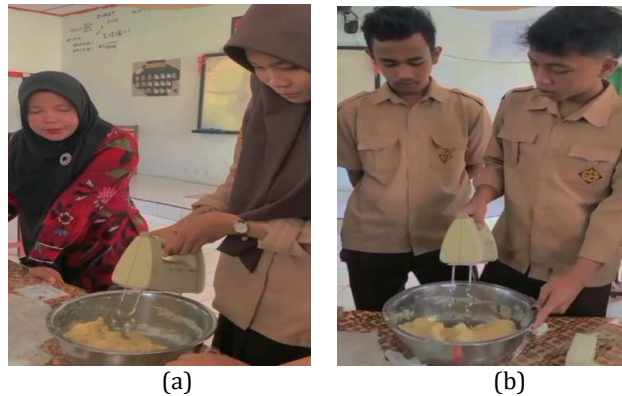


Figure 3: Bread dough making process by Class XI students (source: MAN 5 Agam's documentations)



Figure 4: Presentation of Food Products from Class XII Student Activities (source: MAN 5 Agam's)

documentations)

Discussion

The student entrepreneurship program at MAN 5 Agam has effectively achieved its objective of cultivating an entrepreneurial spirit among students. Through a series of practical activities, students are able to apply their theoretical knowledge of entrepreneurship to real-world contexts, thereby acquiring a more profound understanding of the challenges and opportunities that entrepreneurs encounter. This experiential learning approach serves to bridge the gap between theoretical concepts and practical applications, thereby equipping students with the necessary skills to effectively navigate the multifaceted and ever-evolving business landscape.

The implementation of adaptive and contemporary marketing strategies, including offline marketing through simple bazaars that function as direct points of sale, is encouraged. These events not only facilitate personalized consumer interaction but also function as a nexus for students' entrepreneurial endeavors, offering opportunities to learn about marketing management, customer service, and financial management (Wulandari et al., 2019). Adaptive marketing strategies have been identified as a critical factor in shaping students' entrepreneurial intentions and capabilities. Offline marketing, such as bazaars, provides practical learning environments that enhance the effectiveness of entrepreneurial education programs by aligning with real-world experiences, thereby boosting students' entrepreneurial drive and confidence (Iwu et al., 2021). Furthermore, exposure to successful entrepreneurial models and experiential learning activities, such as marketing simulation games, has been shown to broaden students' perspectives and prepare them for real-world business challenges (Thanasi-Boçe, 2020). The integration of these elements fosters the development of the requisite skills and mindset that enable students to thrive in entrepreneurial endeavors and effectively navigate the dynamic landscape of entrepreneurship (Asimakopoulos et al., 2019; Li & Wu, 2019).

Online marketing, particularly through social media platforms such as Facebook and Instagram, plays a pivotal role in extending market reach for student products beyond local communities. It facilitates the acquisition of experiential learning in domains such as digital marketing, social media administration, and brand development, leveraging functionalities including paid promotion and influencer collaborations (Laurie et al., 2023).

The integration of digital marketing competencies into entrepreneurship education is imperative for students to flourish in the digital age (S. Okeke, 2024). The integration of social media utilization with entrepreneurial knowledge fosters the development of innovative marketing approaches, thereby expanding product reach with minimal financial expenditure. Furthermore, the integration of social media marketing within educational institutions has been shown to enhance brand recognition, attract prospective students, and effectively promote higher education (Anisa et al., 2021).

In the context of the Industrial Revolution 4.0, which is characterized by advanced technology and innovation, the development of relevant entrepreneurial skills is of paramount importance. As Jumali et al. (2024) emphasize, creativity and innovation are key competencies that entrepreneurs must master in this era. The MAN 5 Agam program is designed to provide students with a practical platform for applying entrepreneurial theories, thereby facilitating a more comprehensive understanding of market dynamics and the identification of opportunities that may not be apparent in theoretical learning.

Nonetheless, challenges persist in terms of infrastructure readiness and teacher capacity. As Kaya-Capocci (2022) observes, adopting a more innovative and interactive pedagogical approach necessitates educators who can effectively guide students in entrepreneurial practices. Consequently, madrasahs must prioritize the enhancement of

teacher training and capacity to ensure their effectiveness in serving as facilitators in these programs. The integration of digital technology into the entrepreneurship curriculum faces challenges, particularly in madrasahs with limited access to advanced technology (Yondri et al., 2020). The competencies required in the context of the Industrial Revolution 4.0—namely, critical thinking, creativity, communication, and collaboration (Yondri et al., 2020)—are highly pertinent and can be cultivated through practical entrepreneurship activities. The student entrepreneurship program at MAN 5 Agam is designed to cultivate these competencies and prepare students to become innovative and adaptive individuals, ready to thrive in the digital age.

In addition, madrasah education possesses a distinctive capacity to integrate religious values with entrepreneurship education. As Badawi (2024) observes, an entrepreneurial character education that is firmly grounded in religious values provides a robust foundation for students to thrive both materially and spiritually. The student entrepreneurship activities at MAN 5 Agam are designed to inculcate these values alongside the development of entrepreneurial skills, fostering individuals who are not only competent but also possess high integrity and morality—qualities that are indispensable for the establishment of sustainable and ethical businesses.

In sum, the student entrepreneurship program at MAN 5 Agam makes a substantial contribution to skill development and character building. By applying theoretical knowledge in real-world settings, students develop a comprehensive understanding of the challenges and opportunities inherent in entrepreneurship, preparing them to succeed in the Industrial Revolution 4.0 era. The findings of this study are consistent with previous research, which suggests that integrating technology into pedagogy can significantly enhance student engagement in STEM-based learning. However, to achieve optimal results, further improvements in infrastructure, teacher training, and technology integration are necessary. These enhancements will empower madrasahs to more effectively prepare students for the ever-evolving challenges and demands of the global workforce.

The present study is constrained by several factors. Firstly, its regional scope is limited, and the number of respondents is relatively small. Additionally, the duration of the study may not fully capture the long-term dynamics of the program's impact. Consequently, future research endeavors should consider expanding the geographic coverage, increasing the sample sizes, and extending the study periods to provide a more comprehensive understanding of the effects of student entrepreneurship programs in madrasahs.

Conclusion

The entrepreneurial activities implemented at MAN 5 Agam have been shown to be an effective pedagogical tool in cultivating an entrepreneurial spirit among students in grades 11 and 12. These activities provide students with the opportunity to gain hands-on experience in the production and marketing of goods and services, including satay, bread, and traditional pastries. Moreover, the program has been found to broaden students' understanding of business dynamics, encompassing a range of subjects from production processes to marketing strategies. The program's success is evident in the increased interest and motivation among students to explore entrepreneurship as a viable career path in the future.

Despite these significant accomplishments, there remains an opportunity for deeper reflection to identify areas that need improvement. A pivotal area that necessitates attention is the integration of digital technology into the learning process. In the current era, characterized by the Fourth Industrial Revolution, the ability to understand and

leverage technology is a fundamental requirement for success in an increasingly digitized business environment. Moreover, systematic support from school administrators and the broader educational community is imperative to ensure the program's widespread adoption and its evolution into a sustainable model for other educational institutions.

The present study puts forth a series of recommendations for educators and policymakers with the aim of enhancing the connection between formal education and entrepreneurship training. The ultimate objective of this initiative is to cultivate a young generation that is both independent and innovative, and capable of competing on a global scale. The strategy outlined in this study, when implemented with a targeted approach, holds immense potential to become foundational elements in shaping the character and entrepreneurial skills of future generations. First, the entrepreneurship education in madrasahs should be deeply rooted in Islamic values, emphasizing moral and ethical considerations in business practices. This alignment would help shape entrepreneurs who are not only successful but also socially responsible and guided by strong ethical principles. Additionally, entrepreneurship curricula should incorporate digital literacy to equip students with the skills necessary to leverage technology in their entrepreneurial pursuits. This integration would enable students to adapt more effectively to the demands of the modern economy.

Another critical consideration is the development of sustainable financial models for madrasahs. School leaders should be encouraged to establish school-based enterprises that generate income while simultaneously serving as practical learning platforms for students. This approach would support financial independence and improve the quality of education provided. Moreover, teachers must be provided with ongoing professional development opportunities to enhance their capacity to deliver entrepreneurship education effectively. Training on innovative teaching methods, curriculum development, and the use of technology in education would empower educators to meet the evolving needs of their students.

In conclusion, policymakers should deliberate on the development of supportive frameworks to facilitate the broader adoption of student entrepreneurship programs across other educational institutions. Such frameworks might encompass the provision of resources, training, and infrastructure, thereby ensuring the successful implementation and scalability of these programs.

The findings of this study also underscore the necessity for further research in this area. For instance, subsequent studies could concentrate on formulating a more comprehensive implementation model that can be applied across a variety of educational settings. In-depth analyses of factors influencing the success of these programs would provide valuable insights. Finally, it will be crucial to explore how these findings can inform more inclusive and sustainable educational policies, ensuring the long-term impact and scalability of student entrepreneurship initiatives.

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