

Socialization and Mentoring to Foster Students' Technopreneurial Mindset through the Utilization of Sustainable Technology

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Abstract: *This community service activity aims to foster a spirit of technopreneurship among high school and vocational high school students through education on the use of applied technology as a means of sustainable development. The activity was conducted at three secondary schools in Batam City with a total of approximately 90 students participating, using interactive workshops, technology demonstrations, and discussions based on a practical technopreneurship approach. The material covered included the concept of technopreneurship, strategies for upgrading product quality and digital branding, expanding market reach, automating business operations, and exploring technology-based business opportunities such as service sales, affiliate programs, and intellectual property. Evaluation was conducted qualitatively through observation of participant engagement, active participation in Q&A sessions, and field documentation. The results of the event demonstrated high levels of enthusiasm and active engagement among participants, as evidenced by dynamic Q&A sessions, enthusiasm during the prize-giving session for active participants, and positive responses to all the material presented. Participants understood that technopreneurship can be applied even on a small scale by leveraging available technology. This initiative is expected to contribute to the empowerment of the younger generation as impactful technopreneurs who support the Sustainable Development Goals.*

Keywords: *Technopreneur; applied technology; sustainable development; community service; high school students*

1. Introduction

The rapid development of digital technology in the era of the Fourth Industrial Revolution has brought fundamental changes to the field of entrepreneurship. The ability to utilize technology strategically has become an essential requirement for business actors across various scales (Prasetyo & Trisyanti, 2019). This development has given rise to the concept of *technopreneurship*, which refers to entrepreneurship that places technological innovation at the core of business value creation (Santoso, 2020).

Young people, particularly senior high school and vocational high school students, represent a strategic group in the development of the national technopreneurship ecosystem. Data from Statistics Indonesia (Badan Pusat Statistik, 2022) indicate that the open unemployment rate among individuals aged 15–24 years remained at 16.5%, reflecting a gap between the readiness of young workers and the increasingly digital demands of the labor market. Empowering students through technopreneurship education is therefore considered one of the strategic approaches to addressing this issue (Kemenristekdikti, 2018).

The Sustainable Development Goals (SDGs) established by the United Nations consist of 17 goals, including SDG 8 on Decent Work and Economic Growth and SDG 9 on Industry, Innovation, and Infrastructure. Technology-based entrepreneurship driven by younger generations has the potential to serve as a catalyst for achieving these goals (United Nations, 2016).

Technology-based entrepreneurship education at the secondary school level continues to face several challenges, including limited understanding of the digital ecosystem and the lack of integration of technopreneurship content into the curriculum (Rahmawati et al., 2021). Community service activities can therefore serve as a bridge between the academic community and real-world needs by transferring technology-based knowledge and practical skills to students.

Based on this background, the community service team implemented an educational program entitled "*Utilization of Applied Technology to Optimize Independent Business Operations*" at three secondary schools in Batam City, involving approximately 90 students. The program aimed to:

1. Develop students' understanding of the concept of technopreneurship.
2. Equip students with practical strategies for utilizing technology in entrepreneurial activities.
3. Inspire students to become technopreneurs who create positive impacts on society and contribute to sustainable development.

2. Method

The community service activity was conducted using a participatory and interactive approach that combined three main methods: interactive instruction, technology demonstrations, and question-and-answer discussions. This approach was selected based on the characteristics of senior high school and vocational high school students, who tend to respond more effectively to active and practice-oriented learning methods (Siregar & Nara, 2016).

The activity was implemented at three secondary schools in Batam City. Details regarding the schedule, location, and number of participants are presented in **Table 1**.

1. Community Service Activity Schedule

Table 1. Community Service Activity Schedule

No.	School	Day	Time	Number of Participants
1	SMA Negeri 24 Batam	Thursday,	07.00 – 12.00 WIB	32 student
2	SMK Negeri 5 Batam	Thursday,	12.30 – 16.30 WIB	38 student
3	SMA Negeri 28 Batam	Tuesday,	07.00 – 12.00 WIB	30 student

2. The educational materials were organized into three structured modules, as presented in **Table 2**.

Table 2. Modules and Topics of Technopreneurship Education Materials

No.	Module	Topic
1	Moduel 1	Introduction to the concept of technopreneurship and its relevance in the digital era
2	Module 2	Technology utilization strategies: digital branding, market reach expansion, and operational automation
3	Module 3	Exploration of business opportunities: digital services, affiliate marketing, and intellectual property

The achievement of the program objectives was evaluated qualitatively through the following approaches:

1. Observation of participants' level of participation and engagement throughout the activity.
2. Systematic recording of participatory data, including the number of questions, responses, and participant characteristics such as business ownership and field of study, as structured qualitative indicators.
3. Observation of participants' enthusiasm during the interactive question-and-answer sessions.
4. Photo and video documentation as supporting evidence of the implementation of the activity.

3. Results and Discussion

The community service program was successfully implemented at all three schools according to the predetermined schedule. Overall, the participants demonstrated a high level of enthusiasm throughout the sessions. The implementation results are described below based on the sequence of materials delivered.

Introduction to the Concept of Technopreneurship

At the beginning of the session, the community service team posed a triggering question to the participants: *"Who already owns or manages a business?"* Observations showed that approximately 30% of the participants across the three schools raised their hands. This finding indicates that an entrepreneurial interest already existed among the students, although it had not yet been accompanied by an adequate understanding of how technology could be optimally utilized in business activities.

The team then addressed the misconception that technopreneurship is exclusively associated with large-scale startups. This was explained through a contextual illustration showing how a simple beverage product, such as *teh obeng* priced at IDR 2,000, could be transformed into a higher-value product, such as *teh poci* priced at IDR 5,000, through the use of a cup sealer and visual branding technology (Kuratko, 2016). This contextual approach was effective in reducing participants' initial resistance and broadening their understanding that technopreneurship can begin on a small scale.



Figure 1. Interactive Question-and-Answer Session and Discussion with Participants

Product Upgrading and Digital Branding

The digital branding material received the most enthusiastic response from the participants. Students were introduced to strategies for building brand identity through packaging design, visual content for social media, and profile optimization on e-commerce platforms. The

discussion revealed that most participants who already operated a business had not yet utilized social media strategically. This finding is consistent with Purwana et al. (2017), who identified limited digital marketing literacy as one of the main barriers faced by micro-enterprises in developing their businesses.

Expansion of Market Reach

Participants were introduced to the concept of *multi-channel selling*, which refers to the simultaneous marketing of products through various digital platforms, such as Tokopedia, Shopee, Instagram, and WhatsApp Business. The community service team demonstrated how to create digital product catalogs and develop content strategies to improve organic visibility. Wardhana (2016) reported that the optimal use of digital marketing could increase the revenue of micro, small, and medium enterprises by up to 78% compared with businesses that rely solely on conventional marketing channels.

Management Automation and Operational Systems

Participants were also introduced to various free or low-cost business management applications, including digital point-of-sale applications, automated financial recording tools, and cloud-based inventory management systems. The use of automation can improve operational efficiency while also providing analytical data to support business decision-making. Hartono (2020) found that micro, small, and medium enterprises that adopted digital management systems experienced an average reduction in operational costs of 30% during the first year of implementation.

Exploration of Technology-Based Business Opportunities

The closing session broadened participants' perspectives on three categories of technology-based business models: (1) digital services, such as graphic design, content creation, and website development; (2) affiliate programs that generate commissions through product recommendations; and (3) the monetization of intellectual property. This material received a positive response because it emphasized that entrepreneurship does not always require the sale of physical products (Hadi & Zakiah, 2021).

Qualitative Evaluation of the Activity

Based on observations and participatory data recorded throughout the activity, several qualitative findings were identified and are systematically presented in **Table 3**.

Table 3. Summary of Qualitative Findings from the Community Service Activity

No.	Indicator	Finding	Description
1	Active participation	Very high across all three schools	Numerous questions and spontaneous responses were observed
2	Initial business ownership	30% of participants already operated small businesses	However, technology had not yet been utilized optimally
3	Cross-disciplinary interest	High, including among students from non-business programs	Students from the Design and Construction program actively participated in the discussion

4	Response to the materials	Positive across all modules	The digital branding module received the most enthusiastic response
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Figure 2. Award Presentation to Active Participants during the Discussion Session

These observational findings are consistent with the principles of active learning proposed by Silberman (2006), which emphasize that participants who are actively engaged in the learning process demonstrate substantially higher retention of understanding than those who merely act as passive listeners. The finding that interest in technopreneurship extended across different academic disciplines including non-business programs such as Design and Construction indicates the interdisciplinary relevance of the educational materials delivered.

Overall, the participatory and interactive approach implemented in this program proved effective in reaching and inspiring young participants from diverse educational backgrounds. These results also support the findings of Taqwa et al. (2022), who reported that the implementation of practice-based technopreneurship education significantly improves students' entrepreneurial attitudes and interests.



Figure 3. Group Photo of Participants and the Community Service Team at the First School



Figure 4. Group Photo of Participants and the Community Service Team after the Activity at the Second School



Figure 5. Group Photo of Participants and the Community Service Team at the Third School

Field documentation demonstrated a dynamic discussion atmosphere and a high level of participant engagement. These observational findings are consistent with the principles of active learning proposed by Silberman (2006), which suggest that participants who are actively involved in the learning process achieve substantially higher levels of knowledge retention than those who participate only as passive listeners.

4. Conclusion

Kegiatan The community service program entitled *"Fostering Students' Technopreneurial Mindset through Education on the Utilization of Technology for Sustainable Development"* was successfully implemented at three secondary schools in Batam City, involving a total of 90 participants. The program effectively delivered materials on technopreneurship, digital branding strategies, market expansion, operational automation, and various technology-based business opportunities.

Qualitative evaluation through observation and participatory data recording indicated a high level of enthusiasm and active engagement across all three schools. Approximately 30% of the participants who already operated small businesses gained new insights into the optimization of technology, while students from different academic disciplines demonstrated a comparable level of interest in the materials. The dynamic participation during discussion sessions and the positive responses to all learning modules confirmed that the participatory and interactive approach was effective in inspiring young participants.

Future programs should include continuous mentoring and stronger collaboration with the digital industry ecosystem to ensure long-term impacts on community empowerment and the achievement of sustainable development goals.

Acknowledgments

The community service team would like to express its sincere appreciation to the principals and teachers of SMA Negeri 24 Batam, SMK Negeri 5 Batam, and SMA Negeri 28 Batam for their support and cooperation throughout the implementation of the program. Appreciation is also extended to all participating students for their active engagement during the activities.

The team also gratefully acknowledges Universitas Ibnu Sina for its institutional support, which contributed to the successful implementation of this community service program.

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