

Importance of Technology-based Entrepreneurship in the Education

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Abstract – This research aims to discuss the importance of using technology-based entrepreneurship in education. This research used documentation method to gather data from various resources in written form and analyze it using interpretive method. This research indicated that proper technology management in entrepreneurship education can improve business and increase the ratio of entrepreneurs by 2% of the total population in Indonesia. Technopreneurship in education is important since it makes student learn from real experience, gives them the opportunity to have agile character, good in communication skill, can work individually or in team and student also has multiliteracy capability that enable them to compete in the global world.

Keywords: Information technology, entrepreneurship, technopreneurship, education, market.

Introduction

One of the various employment problems is the imbalance between the existing quantity of candidates and the requirement of employees in jobs which caused unemployment. The problem contributes to other issues such as income inequality, poverty, slow economic growth, urbanization, and political instability. All of this seems intuitively understood by policy makers. Therefore, various attempts have been made by the government in order to increase employment opportunities to reduce the amount of unemployment which has implications for the slow pace of economic growth, given the rapidly increasing number of new labor force entering the labor market. In the globalization era, the growth of Information Technology (IT) is increasing rapidly. Information Technology (IT) makes companies easier to progress and experience rapid development as time flows. Company managers appoints the use of Information Technology (IT) to interact efficiently in the ongoing business method. Several advantages of Information Technology (IT) for Business; Information Technology (IT) strengthen the relation of entrepreneurs with consumers because it helps reduce costs, and Information Technology makes business more flexible (Soegoto, 2014).

Entrepreneurship is acts as a solution to problems in the community to overcome social inequality, poverty, unemployment of productive age, and lack of energy reserves that require creative innovation. In entrepreneurship, not only it requires academic and creative knowledge to create quality products but also needs the willingness to take risks and make it an opportunity and potential. Entrepreneurship could create a good leader because it provides benefits for anyone who wants to be involved in it and can play an active role. Governments always discuss new models and procedures to increase the number of entrepreneurs and of course several print media are also trying to identify and encourage people in creating a company (Torrès & Thurik, 2019). Effects that occurred after the presence of technology in economics and development which involve extensive observations covering various fields of knowledge, geography and design, regional expertise, entrepreneurship, as well as technology that involves economics

(Binnui & Cowling, 2016).

The emergence of youth unemployment is caused due to the lack of skills including education and training, as well as the lack of active labor markets (Abebe, 2020). In achieving the wealth of an area, utilization of technology for entrepreneurship is very important. For example, computer industry and the internet contribute to the industrial economic growth of community - especially in Silicon Valley (Lee, 2018).

Within the European group, entrepreneurship is an important EU goal for life-long education and training policies. Entrepreneurship education in tertiary institutions and vocational training develop competencies for entrepreneurship, entrepreneurial behavior, and employability for vocational graduates (Stadler & Smith, 2017). At this time, universities and entrepreneurship business schools have become the main learning institution, graduates with an entrepreneurship major have greater opportunities in starting new businesses and have strong potential in entrepreneurship so these graduates are more capable of entrepreneurship than other majors (Dhar & Farzana, 2018). Important evaluation that must be carried out as a reference for entrepreneurship education looking at various conductive and contextual issues related to this research. The existence of new research will become a new and relevant benchmark for evaluating and providing information in the success of entrepreneurship education at the local, regional, and national levels (Chandler & Broberg 2019).

Technopreneurship was developed from entrepreneurship, it provides an overview of entrepreneurship using technology-based innovation. Technopreneurship comes from the combination of the word "technology" and "entrepreneurship". The concept itself is based on technology that is used as an entrepreneurial tool, for example the emergence of an online application business, business system security, etc. Technopreneurship is a synergy of strong abilities in mastering technology and an overall understanding of the concept of entrepreneurship. Technopreneurship is the process and formation of new businesses that involve technology as its base with the hope that the making of appropriate plans and innovations that can place technology as one of the factors for national economic development. Another opinion states that Technopreneurship is a process in a community that prioritizes innovation and continuously discovers the main problems of the community, solving problems, and presenting ways of solving problems in order to increase competitiveness in the global market. From the above view, Technopreneurship essentially combine technology and entrepreneurship (Marti'ah, 2017). However, the importance of the combination of technology and entrepreneurship must be inculcated from the early age so educational institution have to include it to the curriculum. The paper argues that it has considerable benefit to the students' ability to compete in the global world. Not only it will enhance student mindset it also gives the opportunity for student to practice in the real world

The paper focuses on the intertwined from three different aspects. First, entrepreneurship, technology, and education. Entrepreneurship and education as well as technology and education has become an interesting discussion as a revolution in the education field. However, to date little research attempted to connect all of three aspects. Thus, in order to bind three aspects into one coherent notion, the analysis used concept of multiliteracies by Baugley, Pullen, and Short (2010) and growth mindset by Brock and Hundley (2016). Literacy related to the ability of reading and writing, however, the concept of multiliteracies in education broadening the concept along with the development of technology into the urgency to literate

multimodal communication environment that has a visual, graphical, gestural, or auditory representation. Baugley, Pullen, and Short (2010) argues that multiple literacy support student to participate to the real problem in the society. Similarly, Brock and Hundley (2016) believed that human’s talent is not fixed and it is always in progress. The important thing for educational institution is to support student to enhance growth mindset by given an environment for student to be brave to face challenge and cope with the failure. Failure must become a productive failure which means it is not the end of everything but as part of learning process.

Method

This research used documentation method and content analysis. Documentation is a technique used to get data from various sources includes statistics, transcripts, books, newspapers, journals, inscriptions, minutes of meetings, agendas, and others. After the data has been collected, the analysis will use interpretive method. This is a process of meaning making practice from the existing literature.

Results and Discussions

Development of Productive Age Populations in Indonesia and the Needs of Entrepreneurship

Indonesia's population growth from 2000 - 2010 increased as much as 1.49 million, it had an effect on the increasing number of working age population. The working-age population reaching 175 million people out of 250 million in 2012 (See Table 1).

Table 1. Population Aged 15 years and over by type of activity

Type of activity	February 2012	August 2012	February 2013
Population 15 Years of Age and Over	172	173	175
	865	926	098
	970	703	712
	120	118	121
Workforce	417	053	191
	046	110	712
a. WorkForce Participation Rate (%)	69.66	67.87	69.20
	112	110	114
b. Work	802	808	021
	804	153	188
c. Open Unemployment *)	7	7	7
	614	244	170
	240	955	524
d. Open Unemployment Rate (%)	6.31	6.13	5.91
Non-Workforce	52	55	53
	448	873	907
	923	592	001
a. School	14	14	14
	307	084	971
	801	632	719
b. Taking care of household	31	33	32
	447	628	185
	888	814	937
c. Others	6	8	6
	693	160	749
	234	146	343

As many as 7.1 million or 5.92 percent Indonesians in February 2013 were listed as unemployed. Although the number of unemployment decreased in the previous year, there were 7.6 million unemployment in February 2013 and 7.2 million in August 2013, but the large number of unemployment still have an impact both socially and economically (Crammond, 2020).

It can be justified that it is difficult to create conditions in which all the productive age population can be 100 percent able to enter the workforce. Thus, developing entrepreneurship is an opportunity for self-development and one of the solutions in solving these problems (Ahmadi et al, 2017).

Entrepreneurship is a way to stimulate nation's competitiveness and enhance economic condition. Soegoto (2019) argues that survey from communication Y&R, BAV Consulting, and Wharton School of Pennsylvania research team shows that the opportunity to be an entrepreneur give a positive impact to the economic. Moreover, he adds that a nation has to have more than 2 percent of entrepreneur to be regarded as developed country. It shows the urgency to

Development of MSMEs in Indonesia

The formation and development of MSMEs or Micro, small, and Medium Enterprises is the initiator for the formation and economic development of a country. The development of a good MSMEs will bring success to a country's economy. At the end of 2010, it was estimated that there were around 53,823,732 MSMEs (98.85%) of all businesses in Indonesia. The contribution of MSMEs in labour assimilation is around 97.22% and the contribution of MSMEs to Gross Domestic Product (GDP) is around 57.83%. Considering the existence of MSMEs and their enormous usefulness in the Indonesian economy, MSMEs empowerment is needed (Satrio, 2019).

Based on data from the Central Statistics Agency, Entrepreneurs in Indonesia as of January 2012 have reached 3.75 million people or 1.56% of the total population of Indonesia. In 2010, there was still 0.24%. But this figure is still far less than other Asian countries, such as China and Japan, which have entrepreneurs more than 10 percent of the population. In the territory of Southeast Asia, Indonesia still behind Malaysia (5 percent) or Singapore (7 percent). The minimum number of Micro, Small, and Medium Enterprises (MSMEs) is considered to be a threat in national economic resilience. Economic conditions become less healthy against the threat of crisis.

Efforts to develop the number of MSMEs are carried out by encouraging entrepreneurial development programs. Entrepreneur creation program carried by Kemenkop dan UKM (Ministry of Cooperatives and SMEs). Like the National Entrepreneurship Movement (GKN). In 2011, Indonesia announced the National Entrepreneurship Movement (GKN), with the aim of increasing the number of Indonesian entrepreneurs, bearing in mind that the number of Indonesian entrepreneurs was only around 0.24% of the population. It is expected that GKN can achieve at least 1% of the Indonesian population in 2014 and finally reach the ideal ratio of 2% of the population.

To that end, the Indonesian government has affirmed a series of policies and action plans to support the entrepreneurial quality and quantity improvement program in Indonesia, in order to become one of the national economic pillars that is resilient in facing the global economic

crisis, as well as solutions to reduce poverty and create employment.

GKN is a real form as a manifestation of the seriousness of the Government of Indonesia to promote entrepreneurship to the wider community. The President of the Republic of Indonesia on various occasions has stressed the importance of developing entrepreneurship, especially among young people and educated people in Indonesia.

As a comparison, GKN throughout 2012 has shown quite favourable conditions. The Indonesian government succeeded in increasing the number of new entrepreneurs, which were originally 570,339 people in 2011 (0.24%) to 3,707,205 people (1.56%) at the end of 2012.

Increasing the ratio of the number of entrepreneurs to the total population of Indonesia is needed to increase competitiveness to compete with other countries. In comparison, Singapore has an entrepreneurship ratio of 7.2%, Malaysia has an entrepreneurship ratio of 2.1%, Thailand has an entrepreneurship ratio of 4.1%, South Korea has an entrepreneurship ratio of 4.0%, and the United States has an entrepreneurship ratio of 11.5% of the total population.

Technopreneurship versus Conventional Entrepreneurship

Entrepreneurship is how to manage risk in business, as for ways that can be done by an entrepreneur:

- a. Recognize and explore market needs or opportunities.
- b. Find the solutions to fill these market opportunities.
- c. Get the resources needed (money, society, and equipment) to run a business.
- d. Manage resources from the first stage (start-up) to the survival and development phase (expansion).
- e. Manage problem and risk related to the business.

Technology is a part that is needed as a solution to problems in order to create opportunities for the entrepreneur to expand their business. The basis of technology's necessity in business is due to the needs of various fields of scientific knowledge on market, solving a problem, as well as to achieve an efficient and effective product in the modern world (Demirhan et al, 2019). Technology can bring benefits so it will create profits.

Differ from conventional entrepreneurship which has goal to make profit and to collect the wealth, technopreneurship used technology to expand challenge and its market. Thus, technopreneurship tends to have larger market and grow faster compare to conventional entrepreneur.

There are two important things that is needed to be considered for the meaning of Technopreneurship (technological entrepreneurship), namely research and commercialization. Research is a discovery and addition to science. Commercialization can be interpreted as a research results or technology from the laboratory to the market in a profitable way. There are a number of ways to commercialize technology, namely: licensing, partnering, or selling it to other parties who will commercialize it.

In general, there are two types of businesses that technopreneurs can delve into, namely lifestyle business and high growth business. Lifestyle business generally does not grow quickly. Businesses like this are usually not attractive to professional investors such as angel investors or venture capitalists. The business does not have enough ability to gain significant wealth.

Someone might want to be a leader, set their own schedule, and want to hold full control of the greater (Demirhan et al, 2019).

Meanwhile, the use of technology in entrepreneurship is closely related to production method that can cooperate with the vision of technological transformation in the future. Several aspects of technology in entrepreneurship management according to the needs are (Oni, 2020):

1. Relation between science and technology transformation, selection and improvement of combination, as well as assets and its attributes.
2. Difference from the existing literatures
3. Collecting and understanding of technology variables as investment instead of recognition.
4. Implementation of superior sustainable competitive theory and company management theory to create technology which can support entrepreneurship activities.

The Influence of technology in entrepreneurship education can change production, consumption, and service provider aspects by following the current trend of IoT (Internet of Things), AI (Artificial Intelligence) as well as VR (Virtual Reality) and AR (Augmented Reality) implementation. The current trend of technology utilization as an act of survival and competition for companies has modified technology to become a crucial feature in planning and entrepreneurship management. One of the examples is the effort to improve worker quality by various technology usage trainings that can be implemented in workers' particular workfield; which directly improve company's quality in all aspects (Cetindamar et al, 2020).

Development of Education in Indonesia

The government has made an agenda for education in Indonesia. Education expenditure has increased significantly after the economic crisis a few years ago. Clearly education expenditure has doubled from 2000 to 2006. In 2007, spending on education was greater than other sectors at 16% or totaling \$ 14 billion, from spending government (See Table 2).

Table 2. Population education data 15 years and above

Education Completed by Population 15 Years and Over	Year 2011	Year 2013
Not / not yet in school	6,41	5,88
Not completed in primary school	14,70	13,91
Primary school/ equivalent	28,73	28,10
Middle school / equivalent	20,75	21,01
BC + / equivalent	29,45	31,14

Building the integrity of the nation through education is done through efforts to distribute the educational chance for all Indonesian. The foundation of educating all Indonesian is advised in the Preamble of the 1945 Constitution. Based on the constitutions the education has to impose the devotion to God Almighty, to acknowledge cultural diversity, to create student that has resiliency, independent, and democratic that are supported by the mastery of science, technology, and art that is neat to improve living standards and welfare of the community (Cetindamar et al, 2020).

The government launched Kampus Merdeka Programmed as way to improve education in Indonesia. The programmed emphasizes the freedom for student to choose to study the field that they are interested outside their field of study in their campus. It also try to reduce the gap between industry and educational institution by connecting the university and industry through apprenticeship. It then can fill the gap between knowledge from university and the real situation in industry.

Entrepreneurship Education in Indonesia

Education has an important function in the development of people and the development of society as a whole. Human development must be carried out in its entirety, which includes the development of thinking power, spiritual power, physical power, and mastery of science, as well as technology, art, and sports. In addition, human development is also needed to produce people who are capable and able to play an active role in developing Indonesian society as a whole.

The task of an education both formal and informal is not only to create educated people, but deeper, the education sector must be able to produce independent people. With the reality that not all Indonesian citizens of productive age and classified as workforce can enter the workforce, the education sector is obliged to find solutions, how to produce outputs that are not only oriented to being workers, on the side of the role of the education department to present and motivate their students so that understand that in addition to being a worker it turns out that the field of entrepreneurship is also a field that is quite intriguing to be explored (Shih & Huang, 2017).

Technopreneurship and Education

Education has a major role in the development of people and also the development of Indonesian society as a whole. Human development must be carried out in its entirety, which encompasses the development of thinking power, spiritual power, physical power, and skills in science, technology, art and sports. From that point on, human development is also intended to produce people who are capable to play an active role in improving the nation. The obligation of an education both formal and informal does not only produce educated people, but more deeply, the field of education must be able to make people independent. The fact shows that not all Indonesian citizens of productive age and classified as a workforce can enter the workforce. They lack of capability to compete in the workforce, even they are graduated with high score. Not to mention they are not smart enough, but there is gap between the knowledge in they get in the educational institution and the requirement in the workforce. Most of them are inexperience and have no clue when they enter the workforce.

The educational institution is obliged to find solutions to fill the gap and create an agile student. Student should be encouraged to be entrepreneur than to be worker. In addition, it turns out that the field of entrepreneurship is also a field that is quite promising to be explored (Yuldinawati et al., 2018). Moreover, the advancement of digital market place makes it possible for small business to grow and reach global market.

The implementation of curriculum that include technopreneurship can be regarded as a solution for educational institution in creating an agile learner that can compete in the global

world. Technopreneurship enable student to have real experience. As seen from figure 1, technopreneurship has many aspects to learn includes innovative enterprise, entrepreneurial ecosystem and also related to the technology advancement.

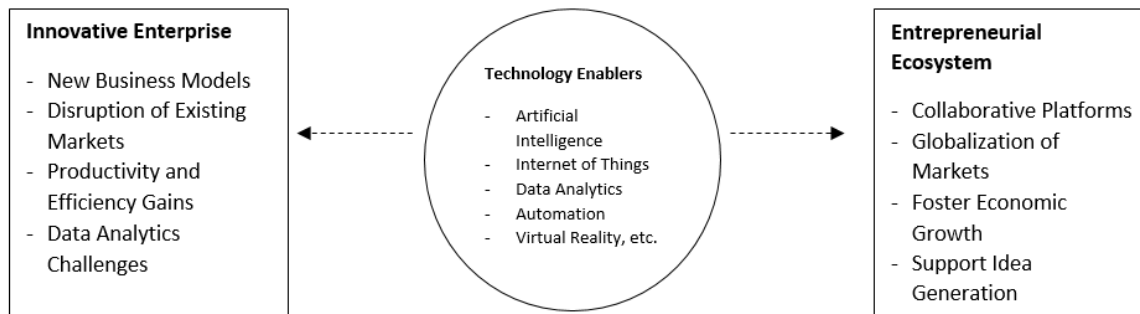


Figure 1. Digital Technology Impacts in Entrepreneur

The various aspects above show the needs of multiliteracies of the student. However, they get to learn all those things not through passive interaction with the lecturer but through their real participation. They are actively making a business model, analyze data customer, and use available technology. By having multiliteracy, student will have broader knowledge and able to mingling in the work environment.

Technopreneur is also support kampus medeka programmer which give a freedom for student to learn subject outside their main field of study. They also learn from real experience which correspond to the Growth mindset learning model. Process is more important than the product. In addition, student is learned to be brave to take a risk and face the failure. Since as Yuliana and Hidayat (2020) underlines that in technopreneurship education must be focused on the growth student's personality which related to the entrepreneurial character including communication ability, agility, and team work. Thus, those who learn technopreneurship will have better soft skill than other students.

Conclusions and Recommendations

To make these successful young entrepreneurs, seriousness from universities is needed in carrying out the campus entrepreneurial mission. The entrepreneurship program that has been initiated and carried out by various tertiary institutions, especially in Indonesia, should be used as an example in initiating the focus of tertiary institutions in creating successful young entrepreneurs who can reform entrepreneurial concepts and technological concepts so as to increase their business development potential. Increasing national entrepreneurship is a great and noble task that requires the togetherness of all components of the nation. The growth of new entrepreneurs cannot be carried out in part or by just one agency, because each agency has limitations according to the main tasks and functions of each.

The new entrepreneurial growth program must be carried out in full by involving all relevant agencies both central and regional governments, educational institutions, business entities and non-governmental organizations having a spirit of togetherness and synergy of

elements of government, academia, business world, new entrepreneurs and all components of society it needs to be continuously encouraged so that more domestic children make the choice of profession to become entrepreneurs.

In the context of developing a more effective national entrepreneurship, it is necessary to evaluate the establishment of a coordinating institution for developing national entrepreneurship that maintains synergy and togetherness aspects of all components of the nation by providing access to more structured harmonization in the world of education, technology and creative bodies to accommodate the results of technopreneurship.

Technopreneurship in education gives opportunities for student to learn from real experience. It gives them the opportunity to have agile character, good in communication skill, and good performance as an individual or a team. In addition, student has also multiliteracy capability that enable them to compete in the global world.

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