Celebrating UC Founder's Day, Universitas Ciputra presents:

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UNIVERSITAS CIPUTRA

ENTREPRENEURSHIP EDUCATION TOWARDS ASEAN ECONOMIC COMMUNITY

Proceeding
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Abstract

This article presents an exploratory study on the implementation of project based learning in starting-up Information Technology based new venture at Ciputra University. The vision from its founding father, Dr. Ir. Ciputra is to give great impact to the nation by being a university that creates entrepreneurs with excellent characters. The Informatics Engineering Department in Ciputra University inherits this vision to create graduates that has strong IT skills as well as Entrepreneurial spirit with excellent character. To ensure the creation of such graduate profile, a specific Entrepreneurship focused curriculum model is needed. Entrepreneurship basic requirement is the understanding of interdisciplinary field of study, which has to be understood by students who are planning to be entrepreneurs led to a classroom with interdisciplinary studies. Technopreneurship subjects which span across semester 6 to 8 provides student with opportunity to transform ideas into business. Using the right curriculum structure, teaching learning methods and powerful mentors, Ciputra University is confident in its approach to increase the success rate of its graduates to become Entrepreneurs particularly in Information Technology related fields.

Keywords: Entrepreneurship Education; Information Technology; Curriculum; Interdisciplinary Studies; New Venture Creation

1. Introduction

Entrepreneurial activity can help reduce poverty is not a new thing, and reflects the assumption that entrepreneurial activity related to economic growth (Schumpeter, 1934). Within this decade, it has been seen that interest in entrepreneurship provides a mechanism to reduce the level of poverty that occurs across countries (Murphy & Coombe, 2009). Hence, in order to be a prosperous nation, entrepreneurship is very important and one of the major determining factors in the increase in the

* Corresponding author. Tel.: +62-31-7451699; fax: +62-31-7451698. E-mail address: twiradinata@ciputra.ac.id
number of entrepreneurs is well designed education system through proper analysis of the strengths, weaknesses, opportunities and challenges faced by educational institutions in Indonesia.

1.1. Background

Ciputra University (UC) is the first university in Indonesia, which is built with entrepreneurship theme. Founded in 2006, UC is the passion and dreams of Dr. Ir. Ciputra who wants to share entrepreneurial spirit to the people of Indonesia. Dr. Ir. Ciputra believe that modern entrepreneurs are those who have balanced soft and technical skills, as well as intuition, entrepreneurial spirit, and proper education. Entrepreneurship without modern concept of education will not last long. He aspires to nurture the spirit of entrepreneurship as early as possible and in conjunction with Ciputra School, UC is built to achieve this goal. UC was established to create future better nation by educating true entrepreneur with faculty supported by a combination of the Entrepreneurs in Residence, Professionals, Academics and Researchers.

Ciputra University applies the principles of Entrepreneurship education on every course where the educational process is directed to produce graduates with competencies as an entrepreneur in accordance with the expertise of each study course.

1.2. Faculty of Entrepreneurship and Humanities

Faculty of Entrepreneurship and Humanities (FEH) is a special school at Ciputra University who do not have any courses, but opening enrollment to all students at the Ciputra University. FEH, in addition also responsible for providing general courses or also known as Liberal Arts, cross disciplinary with all courses at Ciputra University. There are compulsory Entrepreneurship subjects needed to be enrolled by students regardless their courses are (1) E1: The groundbreaker, (2) E2: The Business Model Creator, (3) E3: The Executor, (4) E4: The Innovator, (5) E5: The Global Player.

In addition to organizing public lectures above, FEH also held a variety of training to strengthen entrepreneurship knowledge and skills from various fields such as public speaking, negotiation, business data analysis, etc.

1.3. Department of Informatics Engineering

Informatics Engineering Department at Ciputra University is one of the excellent courses at the Ciputra University which has two courses, namely Information and Multimedia Technology (IMT) and Business Information Systems (BIS). Unlike Informatics Engineering Program at other universities who focus on teaching technical aspects, in Informatics Engineering Program at Ciputra University students will be equipped with entrepreneurship programs so that when they graduate, most of students are ready to run their technology based new venture. It is designed in accordance with the vision of the University founder.

2. Literature Review

Studies related to defining basic terminologies used in the study are discussed first. This is followed by an overview of the nature of recent studies on project-based learning and technology entrepreneurship (technopreneurship). These previous studies were influential in exploring teaching & learning methods which will be discussed in section 3.
2.1. Terminologies

The concepts such as entrepreneur, entrepreneurship, and entrepreneurial all continue under active conversation (Mitchelmore & Rowley, 2010). Researchers and academics have long debated about the definition of entrepreneur? Many entrepreneurship researches also provide slightly different perspective of the word entrepreneur. The Schumpeterian concept of entrepreneur (Schumpeter, 1934; 1942) as creating value by making new combinations causing discontinuity to the current environment, which is the most widely used definition offered in the last 50 years. Subsequently, Bull & Willard (1993) offer the following tentative theory of entrepreneurship, anecdotes and observations taken from the existing literature, in the hope that they will better explain in defining an entrepreneur as a person who will perform the new combination, causing a discontinuity, in condition-related to task motivation, skills, expectations of personal gain, and supportive environment.

The vision of the scientist or engineer who becomes entrepreneur is not a new one. The world of science and engineering has faced evolution in becoming more entrepreneurial nowadays, we can witness the success of the founders of Google, Microsoft, Facebook, etc. Most of them were science or engineering students who experience the transition from technical disciplines to entrepreneurial attitude. Entrepreneurs, unlike pure scientist or engineers are not bound by formulas, rules, and linear patterns of thinking. They also have strong internal locus of control, which means that they believe they are in charge of their destiny, consequently they tend to take responsibility for both their successes and their failures rather than attributing them to some other source (Allen, 2010). Scientists and engineers who commercialize their products are often called technology entrepreneurs or technopreneurs in short. Table 1 below will explain each word relates to entrepreneurship.

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneur</td>
<td>Individual</td>
</tr>
<tr>
<td>Entrepreneurship</td>
<td>Process</td>
</tr>
<tr>
<td>Entrepreneurial</td>
<td>Attitude, Skills, Mindset</td>
</tr>
<tr>
<td>Technopreneurship</td>
<td>Technology Entrepreneurship</td>
</tr>
</tbody>
</table>

2.2. Project-based Learning

Integrating the project into the curriculum is fairly common in the world of higher education. Project-based Learning has received great attention from academia, especially when the purpose of the course is able to put into practice a specific competence, in which students are required to complete a complex task and sustain in real life situation. Project-based Learning designed to encourage students to explore issues in greater depth (Thomas, 1998) and the daily reality-based contextual to the needs of the surrounding community. A study conducted by Bransford et al. (2000) stated that the ability of students to acquire new understanding are enhanced when they are connected to meaningful problem-solving activities, and when students are helped to understand why, when, and how to use the relevant facts and skills.

Benefits of the project-based learning model includes increasing interaction, growth in self-reliance, improved attitudes toward learning process (Thomas, 2000), greater responsibility and sense of ownership among participants (Boaler, 1997). Another intangible benefit is the exposure to higher-order thinking, problem-solving, collaborating, and communicating ideas.
3. Curriculum Structure and Teaching Learning Methods

Informatics engineering department's goal is to produce entrepreneurs in the field of Information Technology. The approach used is to use specific curriculum structure and project-based learning where students are obligated to start new IT venture. Through this kind of learning, it is expected that students are accustomed to running their business at the end of their study period. The curriculum structure of IMT program is illustrated in figure 1 below.

![IMT Curriculum Structure](image)

As we can see from figure 1 above, the left most column is the list of subjects related to entrepreneurship, where Entrepreneurship 1 to Entrepreneurship 5 are held by the faculty of entrepreneurship and humanities in semester 1 to 5, followed with three technopreneurship subjects, namely Technopreneurship 1 (New Venture Creation), Technopreneurship 2 (Startup Internship), and Technopreneurship 3 (Final Project). The curriculum structure combines guidance from ACM-IEEE Computing Curricula 2005 and Ciputra University local context of Entrepreneurship Education.

3.1. Technopreneurship 1

This subject is a continuation of the five Entrepreneurship subjects held by the Faculty of Entrepreneurship and Humanity, where in this subject the opportunity recognition is more specific to the Information Technology based new venture creation (i.e.: IT Consulting Company, Web & Mobile Application Company, etc.). After the completion of this subject, students are expected to make a realistic business plan and company profile for their new IT venture based on three approaches as suggested by Barringer & Ireland (2010) which are trends, problem solving, and filling the market gap.

This subject includes an introduction to Technopreneurship, opportunity analysis, the feasibility analysis of the products or services (market feasibility, organizational feasibility, and financial feasibility), visual prototyping, technology commercialization, new business leadership, legal aspects of technology invention and the formulation of a technology based business plan. The example of company profile from students’ new IT venture can be seen in figure 2 below.
In figure 2 above are some examples of new IT venture created by students during Technopreneurship 1 subjects, the left one is WE.Design, a web design and development which offers service in designing and developing websites for many customers. The right one is Cantabile Technology which focuses in creating mobile application on Android platform, one of the product created by Cantabile Technology is Adventure in MusicLand, which is an Android based application that is built with the aim to help children aged 4-9 years in studying music. This application is expected to help the children to develop skills in three areas: basic music theory, sight reading and aural tests (hearing, clapping and singing).

Each student is assigned a mentor for their new IT venture based on their typical IT field and expertise. Students need to attend at least four consultation sessions before their final exam, which is also their Technopreneurship Project proposal defense.

3.2. Technopreneurship 2

The technopreneurship 2 is a continuation of Technopreneurship 1 where students are given the opportunity to intern for 8-10 weeks (fulltime) or 1 semester (parttime) at reputable established IT company in accordance with the business plan submitted on Technopreneurship 1 (i.e.: Mobile Apps new IT venture will take internship at a reputable Mobile Apps company). Students must provide weekly reports (weekly report) and sent to their mentor for progress monitoring purpose. Internship period is completed within 50 days of work, with alternative patterns as follows:

- Pattern 1: Fulltime Internship in the company with 6 working days (Monday-Saturday) equals to 8 weeks + 2 days.
- Pattern 2: Fulltime Internship in the company with 5 working days (Monday-Friday) equals to 10 weeks.
- Pattern 3: Parttime Internship during a semester until a total presence of 50 working days.

By the end of Technopreneurship 2 period, students are also required to make final report and presentation submitted to the internship coordinator.
3.3. Technopreneurship 3

The last phase of three Technopreneurship subjects, students are expected to focus on their business execution (or commercialization) of their new IT venture. With the appropriate internship experience, students are expected to have more experience in running their new IT venture. Students are required to perform a minimum of 10 session consultation with their mentor. Students who have met the target in accordance with the project proposal submitted on Technopreneurship 1 are allowed to register for the Final Project defense.

3.4. Technopreneurship Project Types

The type of technopreneurship projects that can be executed by students is categorized into two kinds, based on the orientation of creating product for Future Use (Type 1) and Product / Service Implementation with orientation on current use (Type 2). The fundamental difference between Type 1 and 2 lies in the Timely factor of Opportunity Analysis, where in Type 1 this opportunity will be required in the near future so that the approach is more on product push, consequently Type 1 does not require a real client. In Type 2 project undertaken is the real current needs of a client so the approach is more on the market pull, therefore Type 2 requires real clients who have specific requirements. Table 2 will show the summary of the differences between Type 1 and 2.

Table 2. Summary differences between type 1 and type 2.

<table>
<thead>
<tr>
<th>Differences</th>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td>Products for future use</td>
<td>Products/Services for current use</td>
</tr>
<tr>
<td>Client</td>
<td>Novelty</td>
<td>Real</td>
</tr>
<tr>
<td>Approach</td>
<td>Product Push</td>
<td>Market Pull</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Mass product or Implementing sophisticated algorithm</td>
<td>Small to Medium scale project with at least IDR 10,000,000 valuation</td>
</tr>
<tr>
<td>Final Deliverables</td>
<td>Working product and commercialization plan</td>
<td>Project specification, report and payment receipt</td>
</tr>
</tbody>
</table>

3.5. Business Model Canvas

Business Model Canvas (BMC) allows students to freely map their business concept in an easy to manage platform. This platform was introduced by Osterwalder & Pigneur (2010) as a tool to systematically reflect business model. The BMC contains nine business model building blocks within four perspectives which are Infrastructure perspective (Key Activities, Key Resources, and Key Partners), Offering perspective (Value Proposition), Customers perspective (Customer Segments, Channels, and Relationship), and Financial perspective (Cost Structure and Revenue Streams). The common BMC can be seen in figure 3 as follows.
4. Result Analysis and Discussion

To measure the internal and external environment with the intention of better recognizing Technopreneurship 1-3 subjects the SWOT analysis will be used. The SWOT analysis has been long used by many analysts to identify internal strengths in order to take advantage of external opportunities and prevent external threats, while addressing weaknesses. Performing as strategic management tool, the SWOT analysis consists of four building blocks, namely strengths, weaknesses, opportunities, and threats.

The SWOT analysis is useful for formulating strategies based on the combination the four building blocks. The strategies can be grouped into (1) SO strategies to use strengths to take advantage of opportunities, (2) ST strategies to use strengths to avoid threats, (3) WO strategies target to reduce weaknesses to open new opportunities, and (4) WT strategies are defensive plan to reduce weaknesses and avoid threats. The SWOT analysis and strategies of Technopreneurship 1-3 subjects by far is listed in table 3 and table 4 below.

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Strong support from University level</td>
<td>• The approach of technopreneurship 1-3 are still premature</td>
</tr>
<tr>
<td>• Most students’ parent are business man</td>
<td>• Some mentors are still too focussed on product/services features rather than commercialization process</td>
</tr>
<tr>
<td>• Solid entrepreneurship foundation from semester 1-5</td>
<td>• It’s tough to commercialize type 1 project, especially game in Indonesian context</td>
</tr>
<tr>
<td>• Mentors have sound practical background as well as academic experiences</td>
<td></td>
</tr>
<tr>
<td>• Support from both local and international board for technology entrepreneurship</td>
<td></td>
</tr>
<tr>
<td>• Trend of people using IT is increasing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Working closely with media to spread the news</td>
<td>• Similar approach is rapidly followed by larger and more established universities</td>
</tr>
<tr>
<td>• Partnering with investors to help initial funding</td>
<td>• IT Adoption in SMEs are still in the early stages</td>
</tr>
<tr>
<td>• Getting support from Government</td>
<td>• Most of small business still take too lightly on students’ new IT venture</td>
</tr>
<tr>
<td>• Affiliating with established IT vendor</td>
<td></td>
</tr>
</tbody>
</table>
Table 4. SWOT Strategies

<table>
<thead>
<tr>
<th>SO Strategies</th>
<th>ST Strategies</th>
<th>WO Strategies</th>
<th>WT Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initiating collaboration with prominent media such as Tech in Asia which focussed on Technology Entrepreneurship</td>
<td>• Registering patent for Technopreneurship curriculum</td>
<td>• Reviewing Technopreneurship 1-3 approach and teaching methods with help from Government and established IT vendors</td>
<td>• Working with limited number of SMEs as pilot project and write their success story</td>
</tr>
<tr>
<td>• Involving students’ parents as angel investors</td>
<td>• Bridging IT products from personal use to SME use with proper adoption strategy</td>
<td>• Empowering mentors with commercialization skills and exposures</td>
<td>• The type 1 project need to research more on market needs</td>
</tr>
<tr>
<td>• Allow larger network of partners by utilizing mentors’ network</td>
<td>• Holding seminars or conferences among SMEs to encourage higher IT adoption rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pushing more mobile applications, especially Android platform to get more media attention</td>
<td>• Trying different revenue models for type 1 projects</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Conclusion

This article has briefly described the methods implemented by Informatics Engineering department at Ciputra University in order to share a premature approach on technology entrepreneurship (Technopreneurship) subjects to article readers. As this is the first exploratory study of this type to be conducted in the context of Informatics Engineering it is strongly recommended that the study is supported with finding antecedents influencing success factors of Informatics Engineering students in starting their new IT venture.

References