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TOWARDS ASEAN ECONOMIC COMMUNITY

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TABLE OF CONTENTS

PROCEEDING INFO	i
PROGRAMME RUNDOWN	ii
ICONEE COMMITTEE STRUCTURE	iv
PREFACE	vi
TABLE OF CONTENTS	vii
<i>The Mixed Roles of Lecturer in Entrepreneurial Project Subject in International Business Management Department</i>	1
Damelina B. Tambunan	
<i>The Relationship between Student’s Competitive Traits and Entrepreneurial Orientation</i>	8
Jimmy E. Kurniawan	
<i>Meaningful Support for Creating Young Entrepreneurs</i>	16
Jenny L. Setiawan	
<i>Mobile Fashion Store Based on Android Platform</i>	25
Yana Hendriana, Endriadhy Bayu Wibowo	
<i>Fostering Entrepreneurship with a Student Training for Entrepreneurial Promotion (STEP)</i>	32
Gabriel Henry Jacob, Michael M. Gielnik, Kim Marie Bischoff, Michael Frese	
<i>Entrepreneurship Intention in Non-Business Students A Study in the Department of Interior Architecture Universitas Ciputra Surabaya-Indonesia</i>	41
Chendikiawati Wijaya, Tri Noviyanto Utomo, Astrid Kusumowidagdo	
<i>'Like' Me to Change Me : Conceptualizing the Use of Social Media to Develop Teenagers' Entrepreneurship Skill</i>	48
Kususanto Prihadi, Melissa Chua, Rani Prihatmanti	
<i>Creating New Jobs, Gates, and Zuck : Developing Entrepreneurship at Early Teens</i>	55
Kususanto Prihadi, Melissa Chua, Rani Prihatmanti	
<i>Development of Decision Tree Model to Predict Student’s Performance on Entrepreneurship Education based on Entrepreneur Capacity Mapping (ECM)</i>	65
Caecilia Citra, David Boy Tonara	
<i>The Implementation of Entrepreneurship Curriculum in Undergraduate Program on Business Management, University of Tarumanagara, Jakarta</i>	81
Franky Slamet	
<i>Insights From Technopreneurship Subjects: The Case of Informatics Engineering Departement</i>	87
Trianggoro Wiradinata	
<i>Possible Scenarios in Integrating Entrepreneurship into the Visual Communication Design Curriculum</i>	95
Freddy H. Istanto, Christian Anggrianto, Michael Nathaniel Kurniawan	

<i>Strategic Study of Small Enterprise Towards the Establishment of an Independent Entrepreneurs</i>	104
Sukirman	
<i>Pattern of Entrepreneurship Approach as Effort to Develop Belahan Temple at Wonosunyo Village, Gempol Sudistrict, Pasuruan, as Tourism Spot</i>	113
Gervasius Herry Purwoko	
<i>University Community Enggament Program and Entrepreneurship Education: Entrepreneurship Learning for Non Business Participants</i>	120
Hetty Karunia Tunjungsari	
<i>Creative Entrepreneurial Education to Communicate Towards Children through Project Based Learning</i>	127
Maria Christina Liem, Lexi Pranata Budidharmanto Limbing	
<i>Entrepreneurship Family Business Program in Universitas Ciputra</i>	140
Teddy Saputra, Gamaliel Waney, Febe Yuan	
<i>Introduction to Information Systems as part of curriculum subject to contribute University's Entrepreneurship Programs</i>	146
Rinabi Tanamal	
<i>Entrepreneurial Based Learning to Enhance Project Based Learning in Information System Programme</i>	152
David Boy Tonara	
<i>Accounting Software as Support for Small Business: an Implementation of Project-based-Learning</i>	159
Kartika Gianina Tileng	
<i>Building Entrepreneurial Mindset in Network Security Administrator (NSA) Course through Problem Based Learning</i>	165
Yuwono Marta Dinata	
<i>The Influences of Student's Monthly Spending, Mentoring Quality, and Business Capital in Entrepreneurship Learning</i>	171
Denny Bernadus	
<i>Understanding The Role of Mass Media as Social Entrepreneurship Partner: An Exploratory Study of Surabaya Heritage Society</i>	176
Freddy H. Istanto	



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Insights From Technopreneurship Subjects: The Case of Informatics Engineering Department

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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 & Coombes, 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

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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 1. Terminology and Definition.

Terminology	Definition
Entrepreneur	Individual
Entrepreneurship	Process
Entrepreneurial	Attitude, Skills, Mindset
Technopreneurship	Technology Entrepreneurship

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.



Fig. 2. Examples of Students' New IT Venture

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 establishes 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.

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

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.

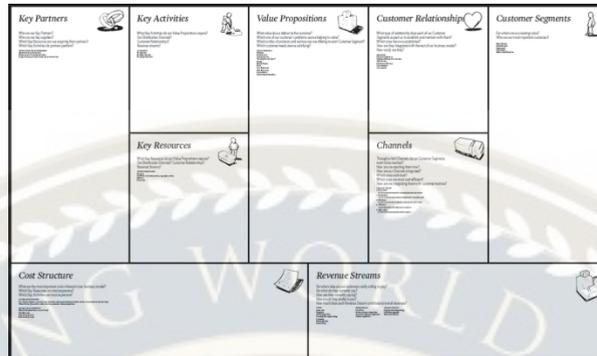


Fig. 3. Business Model Canvas

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 3. The SWOT analysis

<p>Strengths</p> <ul style="list-style-type: none"> • Strong support from University level • Most students' parent are business man • Solid entrepreneurship foundation from semester 1-5 • Mentors have sound practical background as well as academic experiences • Support from both local and international board for technology entrepreneurship • Trend of people using IT is increasing 	<p>Weaknesses</p> <ul style="list-style-type: none"> • The approach of technopreneurship 1-3 are still premature • Some mentors are still too focussed on product/services features rather than commercialization process • It's tough to commercialize type 1 project, especially game in Indonesian context
<p>Opportunities</p> <ul style="list-style-type: none"> • Working closely with media to spread the news • Partnering with investors to help initial funding • Getting support from Government • Affiliating with established IT vendor 	<p>Threats</p> <ul style="list-style-type: none"> • Similar approach is rapidly followed by larger and more established universities • IT Adoption in SMEs are still in the early stages • Most of small business still take too lightly on students' new IT venture

Table 4. SWOT Strategies

SO Strategies	<ul style="list-style-type: none"> • Initiating collaboration with prominent media such as Tech in Asia which focussed on Technology Entrepreneurship • Involving students' parents as angel investors • Allow larger network of partners by utilizing mentors' network • Pushing more mobile applications, especially Android platform to get more media attention
ST Strategies	<ul style="list-style-type: none"> • Registering patent for Technopreneurship curriculum • Bridging IT products from personal use to SME use with proper adoption strategy • Holding seminars or conferences among SMEs to encourage higher IT adoption rate • Trying different revenue models for type 1 projects
WO Strategies	<ul style="list-style-type: none"> • Reviewing Technopreneurship 1-3 approach and teaching methods with help from Government and established IT vendors • Empowering mentors with commercialization skills and exposures
WT Strategies	<ul style="list-style-type: none"> • Working with limited number of SMEs as pilot project and write their success story • The type 1 project need to research more on market needs

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.

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