

Technopreneurship for local economic empowerment by innovative learning module

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ABSTRACT

This research aimed to explain the students understanding and mastery of economics and development of technopreneurship-based economics learning module. Qualitative and descriptive approaches were applied for the research which was begun by some observations and Economics and Entrepreneurship learning identification in 15 study programs of diploma and bachelor degree at State University of Gorontalo or UNG. The data was gathered in the forms of documentation, literature studies, and questionnaires purposively distributed to 100 students. The results showed that: 1) Students realized the importance of learning, understanding, and analyzing the development of Economics not only for academic purpose yet for creating new jobs in society; 2) Economics learning results in UNG at academic year 2014/2015 showed satisfying results based on compared achievement percentage of score A, B, and C at 36%, 50%, and 14% respectively; and 3) In order to have more interesting and well-targetted learning, the contextual and applicable Economics learning module needed to be redesigned. That module would facilitate students in understanding the social reality, such as the increment of intellectual unemployment and the importance of creating more innovative entrepreneurship activities.

Keywords: module, Economics, technopreneurship.

INTRODUCTION

The main keyword of technopreneurship is creativity. By carrying high creativity, the conventional belief will gradually change. Creativity deals with imagination and possibilities, lead to changes with brand new ideas, and gives meaning to the relationship of ideas, mankind, and

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environment. Technopreneurship has also to be built of comprehensive and integral approach done by collaborating culture (innovation, entrepreneurship, and creativity) and concepts (incubatory business, research and development, knowledge management and learning organization) which supported by entrepreneurs' capabilities, connections, and collaborators.

LITERATURE REVIEW

Technopreneurship is a solid synergy between technology implementation as an instrument and a core of a business product as well as independent entrepreneurship's spirit for continuous business. Technopreneurship has a passion to establish a business characterizing integration of technology implementation competences. Therefore, it is expected that many technological-based businesses are popped out by utilizing applicable technology in the whole process of innovation, production, marketing, and even of its internal business operation.

Understanding technological entrepreneurship or technopreneurship is possibly done by identifying key elements which are connected to each other in the process of establishing technology-based business. Prodan (2007) identified those elements as: 1) technological entrepreneur; 2) universities; 3) corporation; 4) capital; 5) market or customers; 6) government; and 7) advisor.

However, A technopreneur is a contemporary entrepreneur (new age) who has interests in technology, creativity, innovation, dynamics, daring to be different, as well as taking new or unexplored path and being really passionate in doing and managing his business (Mintardjo in FORMAS journal 2008:229-230). Technopreneurs combine technology and market for business. When they started their technology-based business, they must have strong willingness to pursue some achievements, conceptual competences and high problem solving, extensive knowledge and the way of thinking, confidence, risk-taking attitudes, realistic thoughts, interpersonal skills, and abilities to control emotions.

LEARNING AND LEARNING MODULE

Knick and Gustafson (1986) stated that learning is a systematic process of planning, doing, and evaluating. Learning is not an instant process, yet it starts with learning plans. Learning process needs to be planned, done, evaluated, and monitored so that it runs effectively and efficiently. Learning process is managed by the teacher to develop students' creative thinking in order to enhance students' thinking ability and to escalate students' knowledge constructing abilities for better understanding on learning materials.

According to Wijaya (1992:96), module refers to the smallest learning program unit highlighting:

1. general instructional objectives
2. special instructional objectives
3. topics for teaching and learning process
4. core materials to be learned and taught
5. position and module function in a wider program unit
6. teacher's role in teaching and learning process
7. learning tools and sources
8. teaching and learning activities that must be consecutively done and absorbed by students
9. worksheets for learning

Module development model is a set of consecutive procedures to execute module learning system development. In developing module, appropriate procedures are needed to achieve the target, clear structure and learning contents, and meet the applied criteria for learning development.

TECHNOPRENEURSHIP-BASED ECONOMICS LEARNING

Technopreneurship-oriented education system is defined as an education system that consistently produces technopreneur graduates who have abilities to

apply technological knowledge referring to the bachelors who have skills to apply their technological knowledge, management and entrepreneurial spirits both as owners or workers in any business and non-business institutions in order to achieve their own welfare or public welfare and for nation's advancement. Technopreneurship is not a novelty (to avoid calling it uncommon) for most of UNG students even though some of the lecturers have already implemented efficient technology-based entrepreneurial learning and similar learning. However, we have not found in textbooks and/or learning modules that contain about technopreneurship specifically. Therefore, this piece of research was a pilot research which its results would be a pioneer of the technopreneurship-based learning module development.

METHOD OF ANALYSIS

In order to achieve the first objective, researcher conducted some observations, distributed some questionnaires, and identified the current applied Economics learning module to reveal students' level of understanding and mastery towards this subject. Moreover, to achieve the second objective, analysis on questionnaires were done to figure entrepreneurial characters.

Students were categorized potential as entrepreneurs if they had above average score on Economics as well as had broad knowledge about utilizing technology and science.

RESEARCH DESIGN

The research employs qualitative and explorative approaches in which its processes were begun with initial observation and Economics learning identification which were implemented in some diploma and bachelor degrees at UNG. Data was gathered by having some documentations, literature studies, and questionnaires distribution to 100 purposive students.

GENERAL DESCRIPTION OF RESEARCH LOCATION

State University of Gorontalo (UNG) was the former Higher Education Institution known as FKIP State University of Manado in Gorontalo and renamed as STKIP Gorontalo and later as IKIP Gorontalo up to 2003. Since becoming a university in 2004, rapid improvements were done in various aspects, such as institutional structures, infrastructures, governance systems, organizational cultures, budgeting, and human resource management. Some UNG's achievements were attained by having several research activities, learning innovations, community services, students coaching, and having safe, comfortable, aesthetical and productive campus environments. Later, UNG was facing governmental and social expectations to be a frontline in building local and nation, a change maker of social life, and a reputable university in regional, national and international level. Those were not excessive expectations since the university had shown big changes in almost all aspects of a university and had been inspired by intellectuals or scientists.

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RESEARCH RESULTS

Economics is commonly known as The Queen of the Social Science. It was caused by multidimensional and dynamic scopes of Economics and its frequent interactions and interrelation with any disciplines, both science and non-science. Economics is taught in higher education in the forms of some subjects, namely Economics Introduction, Micro Economics Theory and Macro Economics Theory. Those subjects were compulsory for at least 15 study programs in bachelor degrees at UNG. Economics in UNG's curriculum is adjusted with the students and alumni's competences expectation from each faculty and study program. One of its expectations of Economics learning is that students and graduates are able to apply the knowledge in their career or business, be skilled at work, create new jobs, and earn some money for themselves and other. Thus, Economics is closely related to the new entrepreneurial invention with well-educated, well-trained, and well-informed aspects.

The research involved 100 students of UNG students as purposive respondents who had completed their Economics Introduction, Micro Economics Theories, and Macro Economic Theories and Entrepreneurship subjects noting that the questionnaires' questions contained of those subjects' contents, skills, and critical thinking. Respondents were from 10 study programs in 5 faculties at UNG.

DISCUSSIONS

The newest discussed topic in any forums and media is related to knowledge and science based Economics. To successfully implement Economics, countries need to simultaneously carry this out in their educational base, its innovation systems, and communication and informational technology systems, along with establishing institutional regimes and high-quality economy (Kefela, 2010:161).

Knowledge and innovation always played a crucial role in economical and social development because any disciplines potentially produce some benefits and profits, including Economics. Old-version human capital theories had been strengthened by the new scientists who suggested that it was not only about education, yet it was a learning experience who helped students to develop their active learning (Arrow, 1962), and innovative dexterity (Romer, 2007) that promoted the concepts of creative class as the base of competitive economy production.

Economics as a discipline that has wider, fast, dynamic development, it is needed to be redesigned to be more efficient, effective, interesting, and economical direct impact to students and society. Using module in learning was aimed to activate students' learning resulted to the creative and innovative soul by relying on science and technology as well as recent social and cultural development.

Economics learning in Economics Introduction subject in 15 study programs in bachelor and diploma degrees at UNG showed a relatively good results from 100 chosen respondents by achieving score A by 36%, score B by 50%, and score C by 14%. Another positive results was showed by entrepreneurship subject in which 49,37% of students got A,

51% of students got B, and only 10.13% got C. The results of Economics Introduction and Entrepreneurship with learning experience satisfaction could show that the good learning results gained by most of the respondents were in line with their learning experience satisfaction.

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One of students' learning experiences in Entrepreneurship subject was to prepare themselves to be future entrepreneurs so that students must create as well as sell their product to certain target or market. It happened that they created the product and sold it yet they ignored the added value, sale value and its competitiveness of their product. They sold homogeneous products, such as corn stick, cassava chips, banana chips, stuffed pancake, cheese bananas, and other processed food products that are commonly sold in local market yet the quality was relatively low.

Since 2012 or the last 3 years, UNG has encouraged the students' entrepreneurship program in Student Creativity Center. The main goal is to produce students as an individual or groups to be able to compete in national level. Students came by several faculties and study programs from bachelor and diploma degree to arrange scientific ideas and business plans as well as to directly manage it. From this program, there were some groups of students who successfully came through National Student Science Week or *week scientific university student Nation (PIMNAS)* and some kinds of creative and innovative business. Nevertheless, there were few students who successfully came through PIMNAS compared to the total number of UNG students at around 20,000 students.

One of the advanced acts of this research is to create Economics learning module which focused on producing innovative and technology literate entrepreneurs. A learning module is a set of learning material documents to encourage and facilitate students to learn independently. As Depdiknas (2002:5) mentioned about module, module is a unity of learning materials presented in the form of self-instruction, which means that learning materials are compiled in that module so that students can learn from it independently with the help of teachers or other/ Therefore, this technopreneurship-based Economics learning module is believed for giving a new nuance of learning.

The subjects in Technopreneurship-based Economics Learning Module are elaborated in details as follow:

Table. 1: Subjects in Technopreneurship-based Learning

Chapter 1	Entrepreneurship and Economics	Chapter 8	National Income
	Entrepreneur definition and entrepreneurship		Concepts and Scopes of National Income
	The important meaning of entrepreneur in development	Chapter 9	Economics Growth
	Creativity, Innovation and Entrepreneurship		Definition of economics growth
	Tips and process of being creative		Driving factors of economics growth
Chapter 2	Concepts and definition of Economics		Economics growth based on Klasik and Schumpeter
	Why is learning Economics important?		Growth, Income Distribution, and Poverty
	What is Economics?	Chapter 10	Technology Innovation as Growth Base
	The basic issues in Economics organization		Starting from crisis
	Economics' purpose and classification		What and how to develop technopreneurship
Chapter 3	Demands	Chapter 11	Inflametion
	Definition and defining factors of demands		Concepts and inflation trigger factors
	The functions of demands		Creeping Inflation and Hyperinflation
Chapter 4	Supplies		Bad effects caused by inflation
	Definition and defining factors of supplies	Chapter 12	Money and Bank
	The functions of supplies		Money
Chapter 5	Demands and Supplies Elasticity		Commercial banks
	Demands Elasticity	Bab 13	International Economy
	Supplies Elasticity		International economy definition
Chapter 6	Market and Competition		Theory and policy of international trade

	Market definition	Theory and policy of international monetary
	Forms of market competition	Organization and international economy cooperation
Chapter 7	Cost Theories	Maximizing profits
	Cost Concepts	
	Short-term Cost	
	Long-term Cost	

In Economics lecturing, a lecturer must have skills in delivering technopreneurship concepts, containing:

1. Themes of Basic Economics
2. Themes of Entrepreneurship Concepts
3. Themes of Roles and Entrepreneurs Function
4. Themes of Innovation and Technology
5. Themes of Technopreneurship and Excellent Entrepreneur

In details, learning module of technopreneur-based Economics will help lecturers on:

- a. Introducing what is a technopreneur
- b. Knowing students' understanding on technopreneurship
- c. Improving students' motivation to be technopreneurs
- d. Inspiring students to create technopreneurship-based business
- e. Knowing technology as business opportunity with high profitability
- f. Initiating students to directly experience market testing and look into solutions needed by customers
- g. Asking students to plan, calculate profit and loss, and see their business development
- h. Giving alternatives for more accurate marketing strategies and discussing them with students
- i. Seeing students' individual abilities on working in team

If this program runs well, it could result to multieffects for students and graduates by having more innovation and more interesting learning experiences and on the other hand, it would produce creative students and graduates to seize the business opportunities.

CONCLUSIONS

From the discussions above, some conclusions can be drawn:

1. Students realized the importance of learning, understanding, and analysing Economics development not only for academic purpose but also for new jobs creation in our society. It does not restrict on having competences demanded by job market, but it also enables students to play strategic roles in economy in any kinds of profession.

2. The result of studying Economics in GSU at academic year 2014/2015 showed quite satisfying results based on compared achievement percentage of score A, B, and C at 36%, 50%, and 14% respectively. 76% of respondents said that the compatibility of learning module used by lecturers and students helped both to achieve learning objective effectively and efficiently.
3. In order to conduct more interesting and well-targetted learning process, Economics learning module needs to be more contextual and applicable. That modul will facilitate students to understand social reality, such as the increment of intellectual unemployment and the importance of improving more innovative entrepreneurship.

REFERENCES

- Acs, Z. and D. Audretsch (1993), 'Innovation and firm size: the new learning', *International Journal of Technology Management*, Special Publication on Small Firms and Innovation, 23–35.
- Aldrich, H.E. and C. Zimmer (1986), 'Entrepreneurship through social networks, in D. Sexton and R. Smilor (eds), *The Art and Science of Entrepreneurship*, New York: Ballinger, pp. 3–23.
- Ardichvili, A., R.N. Cardozo and S. Ray (2003), 'A theory of entrepreneurial opportunity identification and development', *Journal of Business Venturing*, **18**(1), 105–23.
- Arrow, K. 1962. *The Economic Implications of Learning by Doing*, Rev. Econ. Stud., 29(3): 155-173.
- Baron, R.A. (2006), 'Opportunity recognition as pattern recognition: how entrepreneurs "connect the dots" to identify new business opportunities', *Academy of Management Perspectives*, **20**(1), 104–19.
- Cable, D.M. and S. Shane (1997), 'A prisoner's dilemma approach to entrepreneur – venture capitalist relationships', *Academy of Management Review*, **22**(1), 142–76.
- Cohen, W.M. and D.A. Levinthal (1990), 'Absorptive capacity: a new perspective on learning and innovation', *Administrative Science Quarterly*, **35**, 128–52.
- Depositarior DPT, Aquino NA, Feliciano KC. 2011. *Entrepreneurial Skill Development Needs Of Potential Agra-Based Technopreneurs*. Jurnal ISSAAS. Vol. 17. No.1 hal 106-120
- Freeman, C. (1982), *the Economics of Innovation*, London: Frances Pinter
- Hagedoorn, J. (1993), 'Understanding the rationale of strategic technology partnering: Interorganizational modes of cooperation and sectional differences', *Strategic Management Journal*, **14**, 371–85.
- Håkansson, H. (1989), *Corporate Technological Behavior, Co-operation and Networks*, London and New York: Rutledge
- Hardjono WA, Nurhidayat T. 2013. *Pembelajaran Kewirausahaan Politama*. Prosiding Konferensi Nasional Inovasi dan Technopreneurship (KNIT) RAMP-IPB Bogor. ISSN. 2337-4969 hal. 27 – 32
- Kefela, G T. 2010. *Knowledge-based economy and society has become a vital commodity to countries*. International NGO Journal Vol. 5(7), pp. 160-166, August 2010. Available online at <http://www.academicjournals.org/INGOJ> ISSN 1993–8225 ©2010 Academic Journals
- Klofsten, M. (1997), 'Management of the early development process in technology-based firms', *Technology, Innovation and Enterprise*, New York: Macmillan Press.
- Knirk, F.G. dan Gustafson, K.L. (1986). *Instructional Technology, A Systematic Approach to Education* New York: Hlt Rinehart and Winston.
- Prodan, I. 2007. *Technological Entrepreneurship: Technology Transfer from Academia to New Firms*. Doctoral Dissertation. Faculty of Economics. University of Ljubljana
- Romer, P. 2007. *Economic Growth*, by Forthcoming edition, Concise Encyclopaedia of Economics
- Schumpeter, J.A. (1934), *The Theory of Economic Development*, Cambridge MA: Harvard University Press.
- Shane, S. and S. Venkataraman (2000), 'The promise of entrepreneurship as a field of research', *Academy of Management Review*, **25**(1), 217–26.
- Siswoyo, B. 2009. *Pengembangan Jiwa Kewirausahaan di Kalangan Dosen dan Mahasiswa*. Jurnal Ekonomi Bisnis Nomor 2. Tahun 14. Juli 2009. Universitas Negeri Malang
- Widjanarko dkk. 2009. *Pembelajaran Berbasis Inkubator Bisnis (Business Incubator Learning/BIBL) Untuk Mengembangkan Jiwa Kewirausahaan*. UPN Veteran Yogyakarta