Measuring Student's Entrepreneurship Profile
by Using PEC Instrument
(A Case Study in Politeknik Manufaktur Bandung)

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Abstract. *Entrepreneurship is a characteristic that can be observed in the actions of a person or institution. Entrepreneurship includes a range of behaviors, skills and traits that support the development of innovation and creativity. Someone who always works better and is different from others, so that person is an entrepreneur. This research is a preliminary research that aims to produce the profile of entrepreneurial competence of Polman students in Bandung. From the profile of entrepreneurial competence, students are expected to formulate patterns of entrepreneurship development in Polman Bandung. The research method used is descriptive method, with ex post facto research type and survey data collection method through questionnaire. The instrument used in this study was adapted from the Personal Entrepreneurial Competencies (PEC) developed by McClelland with McBer & Co. The results of the study were processed with descriptive analysis statistics. The conclusion of the study shows that the profile dimensions of entrepreneurial competence and the average total score of Personal Entrepreneurial Competencies (PEC) Polman Bandung students are categorized as "medium" criteria, which means that each individual has competence in entrepreneurship, although the level still needs to be improved.*

Keywords: Entrepreneurship, Entrepreneurs, Dimension, Competence

INTRODUCTION

The aim of Higher Education in Constitution number 12 of 2012 is to be a man with faith and fear to God Almighty noble, healthy, knowledgeable, capable, creative, independent, skilled, competent, and cultured for the benefit of the nation. To realize this goal, all students must take part in the general basic course (MKDU). Some of the MKDU have been stated in Constitution number 12 of 2012 as compulsory subjects, namely Religion, Pancasila and Citizenship, and Bahasa Indonesia. In order to improve learning achievement, MKDU is added with English, Entrepreneurship, and courses that encourage the development of other characters, both integrated and individual (Undang-Undang Republik Indonesia Nomor 12 tentang Pendidikan Tinggi 2012, 2012).

Entrepreneurship courses are lessons that shape the entrepreneurial character, or at least students can add knowledge about the intricacies of business both in terms of soft skills and hard skills so that students are able to take advantage from the opportunities around them in creating their own business after graduation or while still in college.

At present, the number of entrepreneurs in Indonesia reaches 400,000 people, or less than 1% of Indonesia's population, which is around 200 million people. This condition is very inversely proportional to what happens in the United States, for example, which has entrepreneur amount 11.5% the population, or neighboring country, namely Singapore with 7.2% of its citizens working as entrepreneurs. The effect is not surprising if the two countries become one of the most economically developed countries in the world (Ditjen Belmawa, 2013).

The creation of college graduates who become entrepreneurs is not necessarily easy to implement. Based on empirical evidence in the field, there is a tendency that college graduates prefer to work with a level of comfort / security and stability in a short time. This is evidenced by the booming number of registrants of civil servants (PNS) who come from universities every year (Ditjen Belmawa, 2013).

The Indonesian government is focusing on increasing the number of entrepreneurs so they can play a role in supporting the country's economy to be more advanced in the future. The growth of the number of entrepreneurs and small businesses needs to be supported by educational institutions, including universities. Universities play a very important role in motivating graduates to become young entrepreneurs, to increase the number of entrepreneurs in the country. The increasing number of entrepreneurs from undergraduates will reduce unemployment and even increase the number of jobs.

Workers who have just graduated from college can create their own jobs so that it can be a solution to reduce unemployment (Munawaroh, Munjiati, Rimiyati dan Fajarwati, 2016)

Education is important to provide basic capital for entrepreneurs. Education can change a person's mindset to make entrepreneurs work by using ideas and creativity. The college and stakeholders are responsible for educating and providing the ability to see business opportunities and manage the business and provide motivation to have the courage to face business risks. The role of universities in motivating their undergraduates to become young entrepreneurs is part of the factors driving entrepreneurial growth (Munawaroh, Munjiati, Rimiyati dan Fajarwati, 2016).

Entrepreneurship and Entrepreneurs

Entrepreneurship is defined as a person's enthusiasm, behavior, and ability to handle business and / or activities that lead to efforts to find, create, implement new ways of working, technology and products by increasing efficiency in the framework of better services and / or obtaining greater profits (Instruksi Presiden Nomor 4 tahun 1995, 1995). Because entrepreneurship is the spirit, behavior, and ability of a person, entrepreneurship involves entrepreneurial behavior, namely: taking the initiative; organizing and reorganizing social and economic mechanisms to change resources and situations to be more useful and profitable; and take risks and failures. Entrepreneurship is a dynamic process in creating wealth, and the process of creating something new that has value by devoting the time and effort needed, taking financial, psychological and social risks, and obtaining results in the form of finance, personal satisfaction and freedom. Entrepreneurship can occur in all fields (Hisrich, Peters, Sheperd, 2005).

Inspired by the notion of entrepreneurship written by French economist Jean-Baptiste in 1800, Drucker stated that entrepreneurs "shifts resources from areas of low productivity and yield to areas of higher productivity and yield", or entrepreneurs change the economic resources from the low area productivity and results towards areas with higher productivity and with greater results (Drucker, 2007). Entrepreneurship is a characteristic that can be observed in the actions of a person or institution. Entrepreneurs in the fields of health, education, and business basically work the same way, they work better, they do it differently than others (Drucker, 2007). Referring to Drucker's opinion, then someone can be categorized as an entrepreneur or not, it can be observed from the person's actions. Someone who always works better and is different from the others, then that person is entrepreneur, whatever the field of work (Drucker, 2007). Entrepreneurship is an innovator (DeKlerk and Kruger, 2002), therefore entrepreneurship encompasses a range of behaviors, skills, and traits that support the development of innovation and creativity (Hisrich, Peters, Sheperd, 2005). Schumpeter said that entrepreneurship is someone who is associated with creative destruction activities (DeKlerk and Kruger, 2002), because entrepreneurs continuously develop existing methods and old products through the introduction of new innovations (Morris, Lewis & Sexton, 1994) Entrepreneurship is a temporary position for someone, unless the person is innovative (DeKlerk and Kruger, 2002). All this means that one cannot be said to be an entrepreneur if it is not innovative, unable to make changes, "destroys" existing conditions creatively (constructive change) in order to be better, has a greater value than before.

Characteristics of Entrepreneurship

According to M. Scarborough and Thomas W. Zimmerer there are eight characteristics of entrepreneurship which include the following (cited in Suryana and Kartib, 2010):

1. desire for responbility;
2. preference for moderate risk;
3. confidence in their ability to success;
4. desire for immediate feedback;
5. high level of energy;
6. future orientation;
7. skill at organization;
8. value of achievement over money;

Personal Entrepreneurial Characteristics

Buiza (2012) said, successful entrepreneurs have common characteristics, which are :

a. Achievement Cluster
   1) Opportunity seeking

    2) Commitment to the work contract
    3) Persistence
    4) Risk taking
    5) Demand for efficiency and quality
b. Planning Cluster
    1) Goal setting
    2) Information seeking
    3) Systematic planning and monitoring
c. Power Cluster
    1) Persuasion and networking
    2) Self-confidence

Makhura (cited in Ruangkrit and Thechatakerng, 2015) mentioned, competencies related to entrepreneurial skills are:

1) Proactiveness
    1) Initiative
    2) Assertiveness
2) Achievement Oritentation
    1) Seeing And Acting On Oppotunities
    2) Efficiency Orientation
    3) Concern Fot High Quality Of Work
    4) Systematic Planning
3) Commitment To Other
    1) Commitment To Work Contrak
    2) Recognition Of The Importance Of Business Relationships

In 1985, McClelland with McBer & Co (cited in Fajar, 2013), had developed a measuring instrument to measure the personal entrepreneurial competencies (PEC). This competencies are :

1) Initiative
2) Sees and acts on opportunities
3) Persistence
4) Information seeking
5) Concern for high quality of work
6) Commitment to work contract
7) Efficiency orientation
8) Systematic planning
9) Problem solving
10) Self confidence
11) Assertiveness
12) Persuasion
13) Use of influence strategies

Finally, Personal Entrepreneurial Competencies (PECs) of entrepreneurs are used to analyze target participants in this study (Sudjana, 2000).

    This research is a preliminary research that aims to produce entrepreneurial competency profiles of students of Politeknik Manufaktur Bandung (Polman Bandung). From the profile of entrepreneurial competencies generated, it will be followed up with the next research, which is formulating the pattern of entrepreneurship development through a technology incubator in Polman Bandung.

RESEARCH METHODS
    The research method used is descriptive method, namely research that attempts to describe a phenomenon, event, event that occurs at the moment (Sudjana, 2000). with a survey data collection method through a questionnaire. While the type of research used is the ex post facto type of research where the researcher does not give certain treatment to the subject in the research, but only observes something that has taken place (Eko, et.al., 2012).

The instrument used in this study was adapted from the personal entrepreneurial competencies (PEC) developed by McClelland with McBer & Co (cited in Fajar, 2013). The results of the study were processed with descriptive analysis statistics. All data collected through questionnaires and documentation were analyzed using percentage descriptive analysis techniques. The data that was collected and then described was then concluded. The research stages can be seen in Figure 1 below.
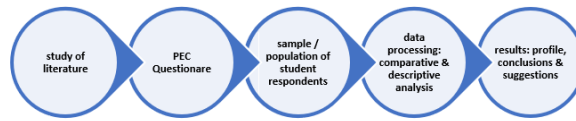

Figure 1. Research Stage

Data analysis uses quantitative analysis statistics with the formulation of Average Calculations and Interval Classes (Sudjana, 2000), as follows:

a) Answers to questionnaires using a Likert scale: 1) Never, 2) Rarely, 3) Sometimes, 4) Often, and 5) Always

b) Average value to calculate each dimension, with the formula:

$$\overline{X} = \frac{\sum x_i}{N}$$

Annotation :

$\overline{X}$ = Average Value

$\sum x_i$ = Amount of all x prices

N   = Sample size or number of data in the sample

c) Determine the assessment criteria with 3 interval classes:

$$Interval\ Class\ Length = \frac{range}{many\ interval\ classes}$$

Which is :

Range = Top Score – Lowest Score

Based on the formula above, the interval class length is:

$$Interval\ Class\ Length\ (i) = \frac{310 - 62}{3} = 82$$

$$Interval\ Class\ Length\ (ii) = \frac{25 - 5}{3} = 6$$

(i)   For PEC total score interval

(ii) For Dimension score interval

Then the interval of the assessment criteria is as follows:

Table 1
Assessment Criteria PEC Total & Dimensions

Criteria	Total Score Interval	Dimension Score Interval
Low	62 – 144	5 – 11
Medium	145 – 227	12 – 18
High	228 -310	19 – 25

RESULTS AND ANALYSIS
Characteristics of Respondents

Respondents were Polman Bandung students, with a sample of 245 (two hundred forty five) students in grade 1 (one) freshment 2018/2019 academik year who filled out the questionnaire with complete fields according to the instructions for filling. Characteristics of respondents are as the table below (see Table 2).

Table 2
Characteristics of Respondents:
Department, Gender, Blood Type,
and Type of High School

Descriptive		Amount	
		N	%
Department	Automation Engineering (AE)	73	29.80
	Design Engineering (DE)	56	22.86
	Foundry Engineering (FE)	39	15.92
	Manufacturing Engineering (ME)	77	31.43
Gender	Male	209	85.31
	Female	36	14.69
Blood Type	O	92	37.55
	A	60	24.49
	B	62	25.31
	AB	22	8.98
	None	9	3.67
Type of high school	High School	152	62.04
	Vocational High School	85	34.69
	Islamic High School	4	1.63
	Others	4	1.63

Source : excel data processing

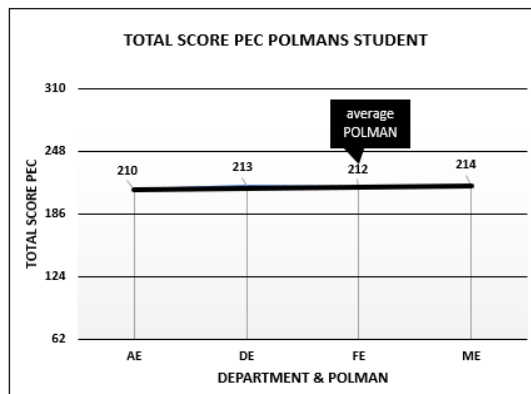**The Personal Entrepreneurial Competencies (PEC)**
1) PEC Total

Figure 2. Total PEC
Source: excel data processing

Table 3
Criteria PEC Total

Criteria	Total PEC Score Interval
Low	62 - 144
Medium	145 - 227
High	228 -310

Source: excel data processing

From Figure 2 and Table 3, it can be explained that the average of Polman Bandung students, they have entrepreneurial competence at "medium" criteria (score average 212). Likewise for the average student in each department shows entrepreneurial competence at "medium" criteria (<228): ME = 214, DE = 213, FE = 212, and AE = 210.

PEC Dimension of Polman and Department

The data in table 4 is used to determine the criteria for the low to high level of each dimension of Personal Entrepreneurial Competencies for students in each department and Polman as a whole. The score in each dimension is the average score of students in each department and all Polman students studied.

Table 4
Criteria Dimension

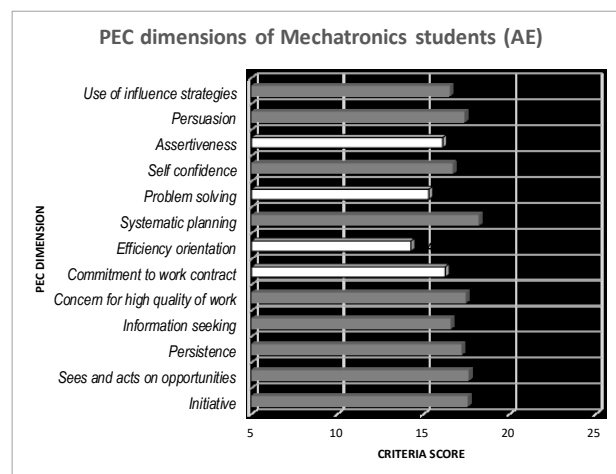| Criteria	Dimension Score Interval
Low	5 - 11
Medium	12 - 18
High	19 - 25

Source: excel data processing
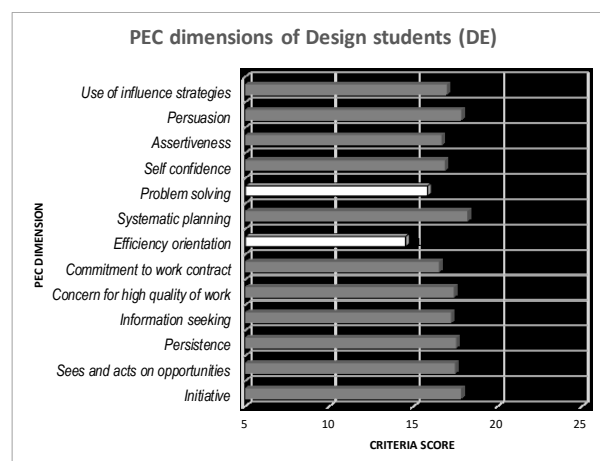

Figure 3 PEC AE
Source: excel data processing

Figure 4 PEC DE

In figures 3 and 4, the profile of dimensions of entrepreneurial competence for students of Automation-Engineering (AE) and Design Engineering (DE) department, on average is at the "medium" criteria level (scores between 12-18). To be a concern is a score of 14, 15 and 16 which has low value in the medium group. In the AE department there are dimensions of "efficiency orientation" (score 14), "problem solving" (score 15), and "commitment to work contract" and "assertiveness" (score 16). While in the DE department there are dimensions of 'efficiency orientation' (score 15) and 'problem solving' (score 16).
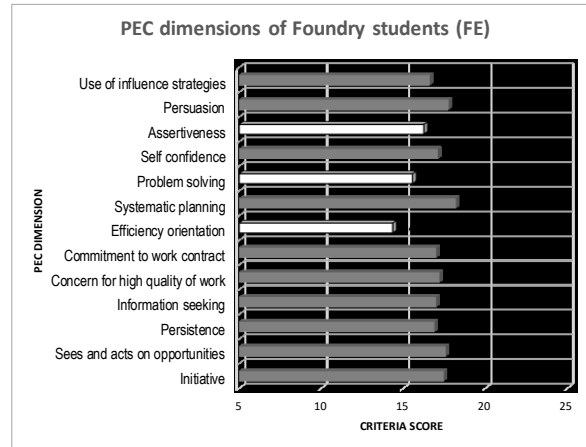

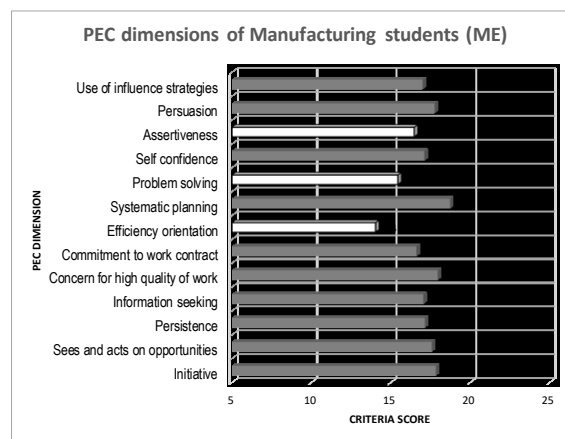Figure 5 PEC FE
Source: excel data processing

Figure 6 PEC ME
Source: excel data processing

Profile of dimensions of entrepreneurial competence for students of Foundry Engineering (FE) and Manufacturing Engineering (ME) departments (Figures 5 & 6), on average is at the "medium" criteria level (scores between 12-18). Score of 14.15 & 16 in FE department is in the dimensions of "efficiency orientation" (score 14), "problem solving" and "assertiveness" (score 16). And in the ME department there are dimensions of "efficiency orientation" (score 14), "problem solving" (score 15), and "assertiveness" (score 16).
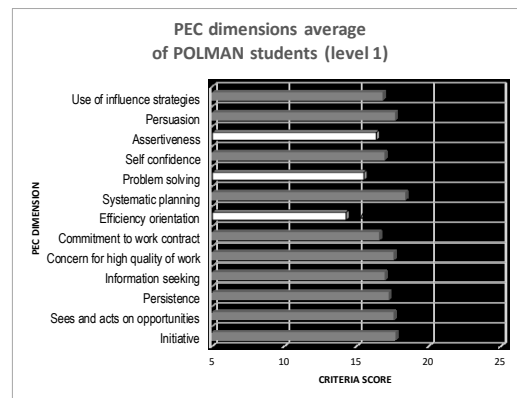
Figure 7 PEC POLMAN
Source : excel data processing

Figure 7 shows a combination fom the average score from the entrepreneurial competence dimensions of students for all departments (AE, DE, FE & ME). Here it also can be seen that the criteria for student entrepreneurial competencies, as well as for each department, criteria are at the level of "medium" (score 12-18). And the dimensions of entrepreneurial competence that must be a concern (scores 14.15 & 16) are on the dimensions of 'efficiency orientation' (score 14), 'problem solving' and 'assertiveness' (score 16)

CONCLUSIONS

From the data discussion, some conclusions are as follows:

- Profile dimensions of entrepreneurial competencies of Polman students are in the 'medium' criteria (score 12-18). This means that on average, the 13 dimensions that make up entrepreneurial competence are already owned by Polman students, although the level of criteria of each dimension still needs to be improved.
- There are 3 dimensions of entrepreneurial competence that need to be a concern because they are in the low score in the "medium" group. They are "efficiency orientation", "problem solving" and "assertiveness"
- The average total score of the Personal Entrepreneurial Competencies (PEC) of the Polman students studied was 212. This score was categorized on the 'medium' criteria (score 145-227). This means that on average, individuals of Polman students have competence in entrepreneurship, even though the level still needs to be improved.

Based on the above conclusions, with student entrepreneurship competence still on the 'medium' criterion, it is necessary to consider the efforts of Polman Bandung to formulate a pattern of entrepreneurial coaching through technological advantages possessed. Among them is by activating technology incubators on campus for students and alumni, so that entrepreneurial competencies are built, and students are interested in choosing an entrepreneurial career.

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