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New Model of Assessment to Measure an Academic Culture in Learning Processes

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ABSTRACT
The learning change in universities is in the form of unwell-created academic culture. It is indicated by low frequency of discussion culture either by lecturers or students, lack of journal reading habit, unwell-created academic environment, and others. This paper proposes model instruments to measure an academic culture in learning activities at Universitas Negeri Yogyakarta and to create validity and reliability for measuring processes of academic culture. The development of this study employs a Plomp model which consists of five stages, including preliminary investigation, design, realization/construction, test, evaluation, and revision. The samples were 42 lecturers and 58 students. The expert judgment was used to validate the instruments, and the Kappa was used to analyze the reliability. The results show that the instruments for academic culture were developed to measure well. Each item of this instruments has high validity and precisely measures the academic culture in learning processes. The reliability index is 0.84, which means that the value of reliability index meets the requirement for the reliability index ($\geqslant$ 0.70). It can be concluded that the proposed instruments can be used to measure the quality to improve teaching and learning activities.

Keywords: *Instrument Development, Academic Culture, Learning Activity.*

1. INTRODUCTION

A quality management system of a university emphasizes on the continuity improvement to strengthen and enhance the quality of university graduates. Therefore, they can easily find a job after graduating from the university. Globalization is a competition era which highly insists on the quality of products. If a product is not qualified, consumers will not be interested to select it. The same case also happens in universities. In this globalization, university must implement quality-based learning.

However, data indicate that university graduates are not easily accepted by world of work, and they are unable to work as what is expected. The huge number of universities decreases the quality of their graduates, because quality standardization of graduates is no longer the universities' goal (priority). They pursue the quantity by accepting as many students as possible.

The quality of education in Law of the Republic of Indonesia Number 20 Year 2003 Article 1 Paragraph 17 mentions that "National standard of education is the minimal criterion of educational systems in all regions of the Republic of Indonesia". The minimal criteria of national standard of education include standards of content, process, graduate competencies, educational staff, facilities, management, funding, and education assessment with periodically planned improvement [1].

One of university programs influencing the quality of its graduates is the learning process. Education as a process recognizes several elements. First, raw-input and instrument are created. Academic norms are the results of learning processes and trials, not an innate gift. Furthermore, each academician, either lecturer or student, must eagerly possess academic culture.

Quality is one of the key factors to successfully compete in a global era and especially in an education world. Success in improving the quality is accepted by all parties, which results in long- and short-term profits Academic culture in an educational institution always develops, moves, and is in line with the dynamic movement and demand of this era. Life changes and renewal and academic culture result in an ideal condition

expected by academicians and researchers. If university's academic culture is not developed, it will be left behind and not be chosen by public [2].

Education is very important aspect in human life. One of the main efforts to improve the quality of education is to improve the assessment [3]. Academic culture in learning must immediately be implemented, and it is preceded by an assessment by systematically collecting information presented in the form of number (score) and representing the characteristic of each individual [4]. The assessment requires a reliable instrument to gain characteristic information of objects related to individual and social aspects. The information of object characteristics will be precise if the applied instruments have a high validity.

Test and non-test instruments must possess validity and reliability, and the result is possibly compared and economical [5]. An instrument is considered valid if it is able to measure what is supposed to measure. An instrument which has high validity brings less measurement fault. It indicates that each subject's score gained by the instruments is fairly similar to the real score. Meanwhile, an instrument is considered highly reliable if test takers' collected score highly correlates with their real score.

Proof source of the instrument validity can be gained from the content test, response process, relation with other variables, and correction for correlation coefficient of attenuation [5]. The use of validity proof relates to the purpose of a test. The testing of content validity is conducted to prove the correlation analysis between content and construct to measure.

CIPP is an evaluation model regarding an evaluated program as a system. This model was developed by Stufflebeam, an evaluation expert, in 1971 [6]. The model is based on the four dimensions such as context, input, process, and product.

Evaluation context is the basic of evaluation and aims to provide rationales which determine purposes. Therefore, in evaluating context, the evaluators' responsibility is to provide description and detail of the environment, needs, and goals. The context evaluation includes a problem analysis related to the program environment and objective condition of the research, and the analysis of strength and weakness of a certain object [6]. The context evaluation is the focus of intuition which identifies opportunities and assesses needs. The needs are formulized as a discrepancy view of reality from ideality. In other words, context evaluation gives decision makers information to plan an ongoing program. Furthermore, context evaluation aims to rationalize a program. The analysis helps a researcher make decision, decide needs, and more comprehensively formulize aims of a program. Context evaluation diagnoses needs which are righteously available, and thus preventing long term loss [7].

Input evaluation aims to provide information to determine how available resources are used to achieve the purpose of the program. Input evaluation includes: personal analysis related to the use of available sources, alternative strategies which need consideration to achieve a program, identification and assessment of system capability, alternative program strategy, procedure design for implementing strategy, funding, and scheduling. Input evaluation is beneficial to guide the program strategy selection to specify procedural plans. Collected information and data are utilized to determine sources and strategies within existing limitations. The basic question is how existing sources are planned to achieve effective and efficient program plans.

Evaluation designed and applied in the implementation is known as process evaluation. Process evaluation is necessary to investigate if the program implementation is in line with implemented strategies. The evaluation involves identifying problems of procedure during the program and activities. Each change occurring during the activity is honestly and accurately monitored. Recording daily activities is importantly conducted because it assists the researchers to make decision in determining the follow-up improvement, as well as strength and weakness of the program. Process evaluation is a sustainable monitoring process in the implementation [6]. It aims to identify or predict various possibilities during the process, for example defects in the procedure design or implementation [8]. Moreover, Badrujaman explains that process evaluation aims to provide information as a basic which improves a program, records, and assesses activities as well as event procedures [8].

Product evaluation aims to measure, interpret, and assess a program's attainment [9]. It measures success of the purpose attainment. Moreover, it aims to collect description and assessment of outcome; to connect all the collected elements to objectives, context, input, information, and process; and to interpret appropriateness as well as values of a program. Product evaluation is possibly conducted by creating operational definition and measuring objective criteria of measurement through several techniques: collecting scores from stakeholders, performing, and analyzing with quantitative or qualitative methods. A product analysis is required to compare designed research objectives with attainment results. The results are in the form of test scores, percentage, observation data, diagram, sociometry, etc. It possibly investigates the correlation of results with their detail purposes. The next procedure is to conduct the qualitative analysis to reveal the reason of research results.

The CIPP model is an evaluation model that views programs that are evaluated as a system. The CIPP model

is an evaluation model that views programs that are evaluated as a system. This model was developed by one of the evaluation experts, Stufflebeam which was developed in 1971 based on four dimensions, namely context dimensions, input dimensions, process dimensions, and product dimensions. Context Evaluation is the basis of an evaluation aimed at providing reasons (rationale) in determining goals [10]. Stufflebeam states that context evaluation is the focus of institutions that identify opportunities and assess needs [6]. Input evaluation includes personal analysis that relates to how to use available resources, strategy alternatives that must be considered to achieve a program.

2. METHOD

Since it is aimed at developing well-qualified assessment instruments for academic culture in learning, the researcher employed development research. The product of the research was assessment instruments for academic culture in learning. The quality of the product was assessed by expert judgment, item analysis, and implementation feasibility in field.

2.1. Development Procedure

Plomp proposes five phases of a general model to solve education problems [9]. They are preliminary investigation, design, realization/construction, test, evaluation and revision, and implementation. The Plomp's development model utilizes a diagram which presents the development cycle as shown in Figure 1.

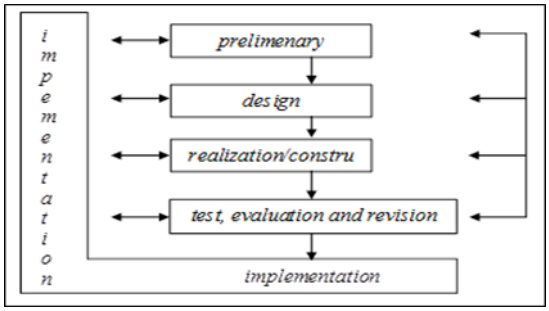

Figure 1 General model to solve education problems.

Those five phases are explained as follows.

Phase 1: Preliminary Investigation or needs analysis

In this investigation, important elements are the gathering and analysis of information, definition of the problem, and the planning of the possible continuation of the project" [8]. The investigation of content elements include: (1) information identification, (2) information analysis, (3) problem definition (limitation), and (4) advanced activity plans. Based on the problem analysis, the fundamental and most important action was to improve quality and to develop learning processes through academic culture. Building academic culture in university is complicated. It requires the socialization process on academic activities thus, academicians get used to performing the academic norms.

Phase 2: Design

This phase is aimed at designing problem solving presented in the early investigating phase. This phase designs solution including the systematic process, in which a comprehensive problem was divided into sub-problems with solution for each sub-problem. Then, the solution of each sub-problem was summarized in a structure of solution. Plomp asserts that characteristic activities in this phase are the generation of alternative solutions [9]. Comparing and evaluating these alternatives result in the choice of the most promising design or blue print for the solution. This phase required a model of problem solving, and CIPP (Context, Input, Proses, and Product) was selected.

Phase 3: Realization/Construction

In this phase, prototype was produced from the designed solutions in phase 2. Related to education problems, phase 2 and 3 were considered as the production phase. In this phase, the researcher arranged instrument items for lecturers and students. The cultural instruments consisted of 36 items and the instrument for students consisted of 34 items.

Phase 4: Test, Evaluation, and Revision

Test was conducted to assess the quality of developed solution plans. From deep consideration, decision to determine the next plan was drawn. The evaluation included systematic steps of collecting, processing, and analyzing. The arranged instruments then were validated by expert judgment: assessment experts and academicians. The experts judged that the instruments met the cultural content of education. Meanwhile, the instrument reliability employed Alpha Cronbach. The assessment showed that the reliability index was 0.84. Thus, it met the required index ($\geqslant 0.7$).

Phase 5: Implementation

The evaluated and revised plan is implemented in the real situation. This stage aims to investigate the effectiveness of the revised learning model based on the result of validation and limited try out. In the next stage, the instruments which meet requirements as a good onewere then tested to the lecturers and students in Yogyakarta State University (YSU). The result of instrument test was used to examine if the cultural instrument was acceptable to both lecturers and students

to follow up the instrument as a pilot project which implemented academic culture in learning in YSU. To find out the respondents' responses, a categorization formula is described as follows:

Determining Category

Completely Agree= Smin + 3p ⩽ S ⩽ Smax
Agree = Smin + 2p ⩽ S ⩽ Smin + 3p – 1
Partially Agree = Smin + p ⩽ S ⩽ Smin + 2p – 1
Disagree = Smin ⩽ S ⩽ Smin + p – 1

Explanation:
Highest score = S max
Lowest score = S min
Data range = S max - S min
Class length = p

The population of this research was all lecturers and students in YSU. The research sample consisted of lecturers and students of Faculty of Engineering, Faculty of Mathematics and Sciences, and Faculty of Education Science. The sample was collected using a simple random sampling technique.

To collect the data, the researchers used a questionnaire. It enabled the research to reveal the response of lecturers and students to academic culture conducted in the learning process.

To validate the instrument, this research employed a content validity by measurement experts and academic culture experts. Meanwhile, to analyze the reliability, the researchers employed Cohen Kappa. If the index of instrument reliability was > 0.7, the instrument was considered reliable. To analyze the data, the researchers used a descriptive analysis.

3. RESULT

The research tries to reveal the process of instrument development for academic culture in learning, instrument validity, and instrument reliability.

3.1. Process of Instrument Development for Academic Culture in Learning

The developmental research is conducted in 5 phases: preliminary investigation, design, realization/ construction, test, evaluation, revision, and implementation.

3.1.1. Preliminary Investigation

Investigating previous studies is the preliminary investigation obligatorily conducted in the research. According to education quality, learning improvement must be immediately conducted. Therefore, the research selects academic culture as the research problem.

Table 1. Outline of academic culture in learning for lecturers.

Variable	Components	Indicators	Aspects
Academic Culture in Learning	Context	Identifying learning purposes and needs to create academic culture	
	Input	Identifying the relevant method and material	System resources
			Lecturer resources
			Facilities and infrastructure
	Process	Identifying appropriate activities and strength of the procedure	Learning activities
			Extra activities
	Product	Lecturers and student satisfaction of performed activities in processes	Performance satisfaction
			Service satisfaction

Table 2. Outline of academic culture in learning for students.

Variable	Components	Indicators	Aspects
Academic Culture in Learning	Context	Identifying learning purposes and needs to create academic culture	
	Input	Identifying the relevant method and material	System resources
			Lecturer resources
			Facilities and infrastructures
	Process	Identifying appropriate activities and strength of the procedure	Learning activities
			Extra activities
	Product	Lecturers and student satisfaction of performed activities in processes	Performance satisfaction
			Service satisfaction

Table 3. Result of instrument testing for lectures.

No	Category	Score Interval	Total	Percentage
1	Completely agree	$117 \leq S \leq 144$	42	100%
2	Agree	$80 \leq S \leq 116$	0	0 %
3	Partially agree	$63 \leq S \leq 79$	0	0 %
4	Disagree	$36 \leq S \leq 62$	0	0 %

Table 4. Result of instrument testing for students.

No	Category	Score Interval	Total	Percentage
1	Completely agree	$112 \leq S \leq 136$	58	100%
2	Agree	$86 \leq S \leq 111$	0	0 %
3	Partially agree	$63 \leq S \leq 85$	0	0 %
4	Disagree	$34 \leq S \leq 62$	0	0 %

3.1.2. Design

This phase requires a model to solve problems, and CIPP (Context, Input, Process, and Product) is selected. In this phase, the researchers arrange instrument items for lecturers and students. Before arranging the instrument, they arrange an outline of academic culture in learning including: variables, indicators, aspects, and question items. Table 1 and 2 present the outlines of academic culture in learning for lecturers and students.

3.1.3. Realization/construction

This phase involves a process of composing question items based on variables and component standards such as identifying learning purposes, relevant method, and material, activities expected by academic culture, and lecturer's as well as students' satisfaction. The following phase is to create the question items for lecturers and students. The instrument for the lecturers consists of 36 items and the instrument for the students consists of 34 items.

3.1.4. Test, Evaluation, and Revision

In the development phase, the instruments are validated. Furthermore, the instrument consistency and reliability are analyzed.

3.1.5. Implementation

The composed instruments have met the validity and reliability. The instruments will be massively tested in YSU. The expected result is to socialize and create the academic culture in learning in YSU.

3.2. Analysis of Instrument Validity and Reliability

The composed instruments are validated by expert judgment. The experts are given an opportunity to assess the content of the instruments. The experts assert that the instruments are considerably applicable for the research. The instruments are then analyzed by employing the Kappa reliability. The Kappa assessment indicates that the reliability index is 0.84. It indicates that the instruments meet the requirement as a good instrument ($\geq$ 0.70). Thus, it can be used for this research.

The instruments which have met the validity or reliability are tested to the sample consisting of lecturers and students in Faculty of Engineering, Faculty of Mathematics and Sciences, and Faculty of Education Science. The test aims to investigate if the instruments of academic culture in learning are accepted by the academicians in YSU. The test' result is presented in Table 3.

The instrument testing indicates that most of the lecturers completely agree with the proposed idea of academic culture in learning. The learning process in university is different from that in secondary school. During the learning process, lecturers are supposed to develop comprehensive self-competence including pedagogical, professional, and social competencies. Academic culture in learning enables the lecturers to enhance their competence and performance.

The result indicates that academic culture is considerably crucial for students. Therefore, the students of the three faculties completely agree with the proposed idea of academic culture in learning in YSU. Because the learning process in university is different from that in secondary school, both lecturers and students must develop more competencies and be independent in learning.

In addition, facilities and infrastructures supporting the learning process are also important. They include internet access, book collection, discussion rooms, and other facilities encouraging the spirit of learning. The university must firmly commit to implement academic culture.

If the learning process successfully implements academic culture, the learning atmosphere will be more conducive, and thus, it can create intellectual students who are able to compete in regional and international levels.

4. DISCUSSION

Learning process in university is different from that in secondary school. In university, it involves all academicians to develop knowledge and raise social awareness. Lecturers and students are expected to more improve their self-development in the learning process reflected through academic culture. Academic culture in learning for lecturers and students is in the form of:

1. reading habit. It is not wondering that reading habit, particularly text book, gradually decreases. Many students prefer references from the internet to printed books. In fact, text books provide more comprehensive materials and explain theories in more detail;
2. participation. The habit to participate in formal or informal forums of scientific discussion is not as expected. A discussion forum in the learning process should frequently be improved so that students can critically think and bravely express their argument, train their self-courage to communicate with others, and so on. Discussion can be held in a formal situation or after class. A discussion forum for students and lecturers must be frequently conducted, particularly for lecturers with similar discipline. It is required to gain perception and develop a certain subject;
3. visionary. Academicians are expected to always plan learning goals, perform responsibility, and show empathy;
4. discipline. Standards of a learning process include punctuality in attending class and submitting tasks, and in obeying all rules set by the university;
5. research. Lecturers should actively conduct research either in faculty or in university as the manifestation of Tri Dharma (Three Visions of University). Lecturers can conduct collaborative research with students adjusted with the lecturers' expertise; and
6. paper writing. Lecturers should actively write more scientific papers in the forms of articles or scientific journals. Rich experience in writing scientific papers enables lecturers to share their knowledge to students. Consequently, the academic culture at class is possibly created.

Furthermore, facilities supporting learning process are crucial. The facilities include:

1. easy internet access;
2. many electric sockets which should be available in or outside the class to support learning process or deepen the course material;
3. easiness to get books in library either reference or other books which are available for lecturers and students;
4. Wi-Fi availability to access internet; it will assist students and lecturers to improve their self-development, knowledge, and skills;
5. availability of discussion corners outside the class either in the garden, lobby, or extra rooms; and
6. quotes which motivate students to learn and to improve their learning motivation; the implementation of academic culture requires the university's firm commitment and planning.

If a learning process comprehensively applies academic culture, comprehensive learning environment will occur to produce generations who are ready to compete in national or international levels.

5. CONCLUSION

The assessment instruments of academic culture in learning in YSU consist of five phases such as preliminary investigation, design, realization/ construction, test, evaluation and revision, and implementation. The instruments are developed for lecturers and for students (1); The characteristics of the assessment instruments for academic culture in learning are validated by measurement experts and education experts. The result shows that the instrument items meet the requirement of content validity. Meanwhile, the instrument reliability is analyzed by employing Kappa. The result shows that the reliability index is 0.84. It indicates that the instruments have high consistency. The instruments which meet validity and reliability are tested (tried out) to lecturers and students of the three faculties: Faculty of Engineering, Faculty of Mathematics and Sciences, and Faculty of Education Science. The results indicate that the lecturers and students highly agree with the academic culture in learning including: reading habit, participation in formal and informal scientific discussion, visionary, discipline, research, scientific journal, and character building at class. Wi-Fi connection, availability of discussion rooms, and other facilities encourage the spirit of learning. In addition, facilities and infrastructures supporting learning process are also important. Furthermore, the university must provide good internet access, book collection, Wi-Fi connection, discussion rooms, quotes motivating students to learn, keep clean, etc.

The description of academic culture in learning strongly correlates with the description of learning quality. This research results in recommendation on quality standards to improve quality assurance of YSU. It is expected that implementing quality standards enables lecturers and students to create a good learning quality.

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