

Assessment Instrument Development for Academic Culture

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Abstract—The occurrence of learning change in universities is in the form of unwell-created academic culture. It is indicated by low frequency of discussion culture performed by either lecturers or students, lack of journal reading, unwell-created academic environment, etc. The aims of this research are to develop instrument used to measure academic culture of learning in State University of Yogyakarta and to create valid and reliable measurement instruments for academic culture in learning. It uses development method with Plomp model which consisted of five stages presented in a diagram of development cycle. The five development stages were preliminary investigation; design; realization/construction; test, evaluation and revision. The samples were 42 lecturers and 58 university students. The expert judgement is used to validate the instrument and Kappa κ used to analyze the reliability. The results show that: (1) Drafting measurement instruments for academic culture in learning. The development results referring to Plom model are preliminary investigation, design, test construction, instrument validation; (2) Instrument validation shows that the instruments developed are valid or each items of the instrument precisely measure academic culture in learning. The reliability index is 0.84 which means the value of reliability index meets the requirement for the reliability index is ≥ 0.70 . Based on the tryout instrument on lecturers and students, the result is 100% lecturers and students totally agree that academic culture in learning starts to be initiated. The instrument developed can be connected to quality standard and give recommendation to improve teaching as well as learning in campus.

Keywords—*instrument development, academic culture, learning activity.*

I. INTRODUCTION

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

However, data indicates that university graduates are not easily accepted by world of work, and they are unable to work as world of work expects. Huge number of universities decreases the quality of their graduates, because quality

standardization of graduates is no longer the universities' goal (priority), rather than quantity or accepting as many students as possible.

The quality of education is stated in Article 1 Paragraph 17 of the Law of the Republic of Indonesia Number 20 Year 2003 that "National standard of education is minimal criterion of educational systems in all regions of the Republic of Indonesia". The minimal criteria of national standard of education consist of content standard, process, graduate competency, educational staff, facility, management, funding, and education assessment with periodically planned improvement (Article 35 paragraph 1 of RI Law Number 20 Year 2003).

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

Quality is one of key factors to successfully compete in a global era and especially in education world. Success in providing quality accepted by all parties results in long term and short term profits. Each academician, either lecturer or student, must eagerly possess academic culture. Academic culture of an educational institution always develops, moves ahead, and is in line with dynamic movement and demand of era. Changes and renewal of life and academic culture result in ideal condition expected by academicians and researchers. If university's academic culture is not developed, it will be left behind and unselected by public [1].

Academic culture of learning must immediately be implemented, and it is preceded by assessment: systematically collecting information presented in the form of number (score) and representing the characteristic of each individual [2]. Assessment requires 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 instrument has validly good quality.

Asserts that test and non-test instrument must possess validity and reliability, and the result is possibly compared and economical [3]. Instrument is considered valid if it is able to

measure what it is supposed to measure. Instrument which has high validity brings little measurement fault. It indicates that each subject's score gained by the instrument is fairly similar to the real score. Meanwhile, Instrument is considered possessing high reliability if test takers' collected score highly correlates with their real score.

Proof source of instrument validity can be gained from content test, response process, relation with other variables, and correction for correlation coefficient of attenuation [3]. The use of validity proof relates to purpose of a test. Content validity test is conducted to prove correlation analysis between content and construct to measure.

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

Evaluation context is the basic of evaluation and aims to provide rationales which determine purposes. Therefore, in evaluating context, evaluators' responsibility is providing description and detail of environment, needs, and goals. Context evaluation includes problem analysis related to program environment and objective condition of the research; and analysis of strength and weakness of certain object [4]. Asserts that context evaluation is the focus of intuition which identifies opportunity and assesses needs. Need is formulized as 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 design decision, decide needs, and more comprehensively formulize purpose of a program. Context evaluation diagnoses need which is righteously available, and thus, it can prevent long term loss [5].

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 needs consideration to achieve a program, identifying and assessing system capability, alternative program strategy, procedure design for implementing strategy, funding, and scheduling. Input evaluation is beneficial to guide 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 implementation activity 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 activity. Each change occurring during the activity is honestly and accurately monitored. Recording daily activity is importantly conducted because it assists researcher take decision to determine follow-up improvement, as well as strength and weakness of the program. Process evaluation is a sustainable monitoring process on planning implementation [6]. It aims to identify or

predict various possibilities during the process, for example defects in procedure design or implementation (Badrujaman, 2009). Moreover, Badrujaman (2009) explains that process evaluation aims to provide information as a basic which improves a program, records, and assesses activity as well as event procedures.

Product evaluation is an evaluation which aims to measure, interpret, and assess a program's attainment [7]. Product evaluation is an evaluation which measures success of purpose attainment. Moreover, evaluation aims to collect description and assessment of outcome; connect all the collected elements to objectives, context, input, information, and process; and interpret appropriateness as well as value of a program. Product evaluation is possibly conducted by creating operational definition and measuring objective criteria of measurement through several techniques: collecting score from stakeholders, performing, and analyzing with quantitative or qualitative methods. Product analysis is required to compare designed research objectives with attainment results. The results are in the form of test score, percentage, observation data, diagram, sociometry, etc. It possibly investigates the correlation of results with their detail purposes. The next procedure is conducting qualitative analysis to reveal the reason of research results.

The rest of this paper is organized as follow: Section II describes proposed research method. Section III presents the obtained results and following by discussion in Section IV. Finally, Section V concludes this work.

II. PROPOSED METHOD

Since the aim of this research was to develop a well-qualified assessment instruments for academic culture of learning, this research employed developmental research. The product of this research was assessment instruments for academic culture of learning. Quality of the product was assessed by expert judgment, item analysis, and implementation feasibility in field.

A. Development Procedure

Plomp (tahun) proposes five phases of general model to solve education problems, they are: preliminary investigation; design; realization/ construction; test, evaluation and revision; and implementation. Plomp's development model utilizes a diagram which presents development cycle as shown in Figure 1.

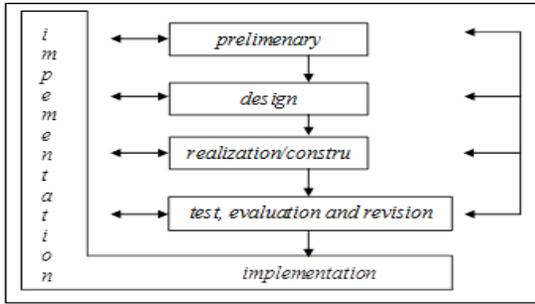


Fig. 1. General model to solve education problems

From Figure 1, those five phases are described as follows.

Phase 1: Preliminary Investigation or needs analysis or problem analysis. Assert that: “in this investigation, important elements are the gathering and analysis of information, the definition of the problem and the planning of the possible continuation of the project” [8]. The investigation of content elements included: (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 improving quality and developing learning process through academic culture. Building academic culture in university is complicated. It requires socialization process on academic activities, thus, academicians get used to performing the academic norms.

Phase 2: Design. This phase aimed to design problem solving presented in the early investigating phase. This phase designed solution including 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 (1997: 6) asserts that “characteristic activities in this phase are the generation of alternative (part)solutions and comparing and evaluating these alternatives, resulting 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, phases 2 and 3 were considered as production phase. In this phase, the researcher arranged instrument items for lecturers and students. Cultural instruments consisted of 36 items and 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 required index for ≥ 0.7 .

Phase 5. Implementation

The evaluated and revised plan is implemented in the real situation. This stage aims to investigate the effectiveness of revised learning model based on the result of validation and limited try out. In the next stage, the instrument which meets requirements as a good instrument is then tested to the lecturers and students in Yogyakarta State University (YSU). The result of instrument test aims to examine if the cultural instrument is acceptable to both lecturers and students to follow up the instrument as a pilot project which implements academic culture of learning in YSU. To find out the respondents’ responses, categorization formula is employed as follow:

Determining Category

Completely Agree	= $S_{min} + 3p \leq S \leq S_{mak}$
Agree	= $S_{min} + 2p \leq S \leq S_{min} + 3p - 1$
Less Agree	= $S_{min} + p \leq S \leq S_{min} + 2p - 1$
Disagree	= $S_{min} \leq S \leq S_{min} + p - 1$

Where:

The highest score	= S_{max}
The 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 samples were lecturers and students of Faculty of Engineering, Faculty of Mathematics and Sciences, and Faculty of Education. The samples were collected randomly (simple random sampling). Data collection technique of this research was questionnaire. It enabled the research to reveal the response of lecturers and students to academic culture conducted in learning process. To validate the instrument, this research employed content validity of measurement experts and academic culture experts. Meanwhile, to analyze the reliability, this research employed Cohen Kappa. If the index of instrument reliability was > 0.7 , the instrument was considered reliable. This research employed descriptive analysis to analyze the data.

III. RESULTS

This research reveals: process of instrument development for academic culture in learning, instrument validity, and instrument reliability.

A. Process of Instrument Development for Academic Culture in Learning

This developmental research is conducted in 5 phases i.e. preliminary investigation; design; realization/construction; test, evaluation, and revision; and implementation. They are described as follow.

1) Preliminary Investigation

Investigating previous studies is the preliminary investigation obligatorily conducted in this research. According to education quality, learning improvement must be

immediately conducted. Therefore, this research selects academic culture as the research problem.

2) Design

This phase requires a model to solve problems, and CIPP (Context, Input, Process, and Product) is selected. In this phase, the researcher arranges instrument items for lecturers and students. Before arranging the instrument, this research arranges an outline of academic culture in learning including: variables, indicators, aspects, and question items. Tables I and II present the outlines of academic culture in learning for lecturers and students.

TABLE I. OUTLINE ACADEMIC CULTURE IN LEARNING FOR LECTURERS

Variable	Component	Indicator	Aspect
Academic Culture in Learning	Context	Identifying learning purpose and needs to create academic culture	
	Input	Identifying relevant method and material	System resources
			Lecturer resources
			Facilities and infrastructure
	Process	Identifying appropriate activities as expected and strength of the procedure	Learning activities
			Extra activities
	Product	Lecturers and student satisfaction of performed activities in process	Performance satisfaction
Service satisfaction			

TABLE II. OUTLINE ACADEMIC CULTURE IN LEARNING FOR STUDENTS

Variable	Component	Indicator	Aspect
Academic Culture in Learning	Context	Identifying learning purpose and needs to create academic culture	
	Input	Identifying relevant method and material	System resources
			Lecturer resources
			Facilities and infrastructures
	Process	Identifying appropriate activities as expected and strength of the procedure	Learning activities
			Extra activities
	Product	Lecturers and student satisfaction of performed activities in process	Performance satisfaction
Service satisfaction			

3) Realization/construction

This phase involves a process of composing question items based on variable 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 composing

question items for lecturers and students. Cultural instrument for lecturer consists of 36 items and the instrument for students consists of 34 items.

4) Test, Evaluation, and Revision

In development phase, the instrument must be validated. Furthermore, the instrument consistency, reliability, is analyzed.

5) Implementation

The composed instruments have met validity and reliability. The instruments will be massively tested in YSU. The expected result is socializing academic culture of learning and creating culture of learning quality in YSU.

B. Analysis of Instrument Validity and Reliability

The composed instruments are validated by expert judgment. The experts are given opportunity to assess content of the composed instruments. The experts assert that the instruments are considerably applicable for the research. The instruments are then analyzed by employing Kappa reliability. Kappa assessment indicates that the index of instrument reliability is 0.84. It indicates that the instruments meet the requirement as a good instrument, ≥ 0.70 , and thus, they are considerably applicable for this research.

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

TABLE III. THE RESULT OF TESTING INSTRUMENT FOR LECTURES

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

TABLE IV. THE RESULT OF TESTING INSTRUMENT FOR STUDENT

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

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

The result indicates that academic culture is considerably crucial for students. Therefore, the students of the three faculties highly agree with the proposed idea of academic

culture of learning in YSU. Learning process of university is different from that of secondary school. Therefore, both lecturers and university students must develop more competences and be independent of their learning

In addition, facilities and infrastructures supporting learning process are also important. They include: good internet access, comprehensive book collection of library, Wi-Fi connection, the availability of discussion rooms, and other facilities encouraging the spirit of learning. The university must firmly commit to concept the implementation of academic culture.

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

IV. DISCUSSION

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

- Reading habit. It is not wondering that reading habit, particularly text book, gradually decreases. Many students prefer references from the internet than sources from printed books. In fact, text books provide more comprehensive materials and explain theories in more detail;
- The habit of participating in formal or informal forum of scientific discussion is not as expected. Discussion forum in learning process should frequently be improved so that students can critically think, bravely deliver their argument, train their self-courage to communicate with others, etc. Discussion can be held in formal situation or after class. Discussion forum for students and lecturers must be frequently conducted, particularly for lecturers with similar field. It is required to gain similar perception of certain subject and to develop this subject;
- Visionary. Academicians are expected to always have clear learning goals, responsibility, and empathy;
- Discipline in learning process standards including punctuality in attending class and
- submitting tasks, and in obeying all rules determined by the university;
- Actively conducting 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
- Writing more scientific papers in the forms of opinion, articles, or scientific journals. Rich experience in writing scientific papers enables lecturers to share their knowledge

to students. Consequently, academic culture at class is possibly created.

Furthermore, facility supporting learning process is crucial. The facility includes:

- Easy internet access;
- Many electric sockets must be available in the class or outside the class to support learning process or deepen the course material;
- Easiness to get books in library either reference books or other books which are available for lecturers and students;
- Wi-fi availability to access internet. It will assist students and lecturers to improve their self-development, knowledge, and skills;
- The availability of discussion corners outside the class either in the garden, lobby, or extra rooms to conduct discussion; and
- Writing notes which motivates students to keep them learning 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 create generation who are ready to compete in national or international level.

V. CONCLUSION

This research concludes that: (1) The assessment instruments of academic culture of learning in YSU consist of five phases preliminary investigation; design; realization/ construction; test, evaluation and revision; and implementation. The instruments consist of an instrument for lecturers and an instrument for students; (2) The characteristics of assessment instruments for academic culture of 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 reliability index is 0.84. It indicates that the instrument has high consistency. The instruments which meet validity and reliability are tested (try out) to lecturers and students of three faculties: Faculty of Engineering, Faculty of Mathematics and Sciences, and Faculty of Education. The results indicate that the lecturers and students highly agree with the academic culture of learning including reading habit, participating in formal and informal scientific discussion, visionary, discipline, actively conducting research, composing scientific journal, and creating character building at class. Wi-Fi connection, the availability of discussion rooms, and other facilities encouraging the spirit of learning. In addition, facilities and infrastructures supporting learning process are also important. Furthermore, university must provide good internet access, comprehensive book collection of libraries, Wi-Fi connection, the availability of discussion rooms, quotes motivating students to learn, clean toilets, 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 good learning quality.

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