Java Culture Internalization in Elektrometri Learning Based Inquiry Laboratory Activities to Increase Inter-Intrapersonal Intelligence

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Abstract: ***This study aims to improve inter-intrapersonal intelligence chemistry student teachers who have internalized java culture through the implementation of elektrometri learning based inquiry laboratory activities. Quasi experimental design with pretest-posttest control group used in this study and difference between front-end tests are assumed to be effect of treatment. Subjects were 35 students as control class and 29 students experimental class from Chemistry Education Department, Science and Mathematics Faculty, State University of Semarang who contracted Instruments Analytical Chemistry Practicum subject on academic year 2010/2011. Javanese cultural internalization measured by descriptive from completed questionnaires, inter-intrapersonal intelligence measured by quantized observations with rubric, while concept understanding measured by narrative form tests. Increased of concepts mastery analyzed by t-test. Measurement observation result of inter-intrapersonal intelligence was determining total score then compared % increase for each indicator. The results showed that implementation of learning based inquiry laboratory activities elektromeri material on chemistry student teachers can improve inter-intrapersonal intelligence and student concepts mastery. Javanese culture internalization contributes positively to increased inter-intrapersonal intelligence.***

Keywords: javanese culture, elektrometri learning, inquiry lab.

1. Introduction

Javanese cultural values have evolved over the years has been internalized in javanese and javanese work culture, so that being human who resilient or hard work, patience, can work together, not arrogant, and makes javanese can live and be accepted in a variety cultural environments. (Wardani, 2011), from preliminary study revealed that 97% of student teachers still recognize and preserve Javanese culture in life. This condition more or less affecting work culture and mindset chemistry student teachers.

All students who observed in preliminary studies, still feel that culture values such as santoso agawe pillars, mutual cooperation and ojo dumeh there in daily. Therefore this value very supportive in working groups at laboratory, and potential in improving interpersonal intelligence. Further still in Wardani (2011) revealed that 91% student teachers recognize that nastiti cultural values, ngati-ati, tenacious work culture, patient, diligent, honest, and cultural alon-alon waton kelakon, still alive in their daily and very potential in developing intrapersonal intelligence.

In addition to above life principle, some Javanese cultural heritage associated with technology element, knowledge and scientific process. Kris heritage manufacturing and puppet closely related to technology culture element, equipment and knowledge, which in education relates among other with chemical processes. Kris making process dealing with how to make alloy composition which rustproof, strong malleable and can be mounted. Meanwhile kris preservation and metal accessories on puppet closely related to concept and gilding process, which in chemistry concerned with elektrometri concepts.

Elektrometri is part of analytical chemistry which in laboratory activity always associated with an electrolyte solution, electrode, electrochemical cell and an electric current. Elektrometri practicum, as well as other lab practicum related to quantitative analysis, always associated with thoroughness, accuracy, and good cooperation within group. Scientific attitude is a Javanese cultural values that need to be developed that is associated with Nastiti ngati-ati and mutual cooperation.

As part of educational process, chemistry teachers should be able to capture these cultural elements to be accommodated in learning, thus chemical knowledge acquisition process always see cultural elements from various aspects such as that delivered by Suastra (2005) and Baker (1995), that learning will be more easily understood when teachers pay attention to students' culture. Therefore, chemistry teacher candidates need to acquire experience in learning process as a way learning that can accommodate the needs of cultural internalization.

Practicum implementation at Lembaga Pendidikan Tenaga Kependidikan (LPTK) especially also in other universities generally carried out by manual verification models that are prescribed, thus providing less opportunity to investigate and develop creativity suboptimal (Corebama, 1999). Chemistry practicum problem including analytical chemistry with manual verification also catch attention the researchers such as Eggleston and Leonard (McComas, 2005); Pasha (2006); Adami (2006), and Amarasiriwardena (2007). The researchers argue that practicum learning outcomes should be in addition to increasing concept understanding, and develop basic skills to experiment, also develop problem-solving skills with cultural observance.

From the preliminary study (Wardani, 2012) revealed that

practicum learning outcome of instrument analytical chemistry at chemistry education department FMIPA UNNES apparently only managed to increase basic skills development to carry out experiments. Practicum with implementation pattern that continues today does not give students opportunities to identify problems, elaborating information, work together in groups to decide and evaluate procedures to be used, data analyze and presented in small groups and classes. These indicators are part of inter-intrapersonal skills (Cacciotore, 2009 and Lazear, 2004). These indicators also reflected javanese culture actualization.

Laboratory activities including elektrometri practicum, as listed in the core curriculum point of instruments analysis chemistry practicum, expected to develop chemical concepts by leveraging technology and art, as well as using chemical equipment in developing elektrometri concept. The second point suggests that elektrometri basic concept development can be achieved through laboratory activities are well planned. Well planned practicum should refer to analytic basic capabilities including electroanalytical to be possessed by student teachers. Basic skill which should have an electroanalytical basic concept understanding, analysis techniques and analysis application to the samples. In addition with understanding who is student are expected to complete problems associated elekrometri analysis techniques with inquiry stage.

Learning Based Inquiry Laboratory highly recommended for use in laboratory activities to provide a challenging learning environment, encourage students to ask questions, able to overcome the fear of doing wrong as well as provide an opportunity to take initiative in task addressing and teamwork (Tan, 2004). All activities are included in the interpersonal activity. By the time students solve a problem in learning based laboratory inquiry activities, then students should strive to plan, evaluate, and manage the strategy used, according to which all three Brawn (in Marzano, 1988) and Lazear (2004), included in the intrapersonal activity.

This study is intended to learning model implementation of instrument analytical laboratory practicum based laboratory activity are predicted to increase student teachers inter-intrapersonal intelligence who have internalized javanese work culture, with hopes to contribute in quality improving the chemistry teacher candidates and learning process quality. Inter-intrapersonal intelligence development prospective teachers with Javanese culture internalization through practicum seen potential to do because about 80% chemical science lectures at LPTK with practicum and 100% of students still recognize Javanese culture in their life.

2. Method

This study was designed with R and D method, where the preliminary study performed various studies related literature, current curriculum, and javanese culture elements. The next stage possible lecturing program expansion based laboratory inquiry on electrochemistry subject. This design reflects the strategy to develop inter-intrapersonal skills based javanese culture internalization.

Furthermore, after testing and revision, the draft then implemented in a real learning at classroom. Subjects were 35 students control group and 29 experimental group. All of practicum students Instruments Analytical Chemistry on 2010/2011. Experimental class was treated form of learning based problem, whereas learning in the control class is practicum at laboratory with standard practicum procedure. The study was conducted at Chemistry Department FMIPA one of state LPTK at Central Java.

Instrument to reveal inter-intrapersonal intelligence and javanese work culture is questionnaires and unstructured interviews. Concept understanding also measured by narrative form tests. Improved concept understanding analyzed by normalized gain comparison (N-gain) between experimental group and control group, both for overall and for upper and lower class category, whereas observation and interviews were descriptively analyzed. Student response to learning application of problems based on practicum lectures Instruments Analytical Chemistry captured through questionnaires..

3. Result and Discussion

Based on the results study various literature, javanese culture, as well as concepts related elektrometri, lectures planned emphasis on problem solving, and refers to javanese culture internalization. Lectures measures adapted from Pasha (2006), Adami (2006), and Cacciotore (2009). Class begins with a lecture contract, followed by:

(1) student orientation to the problem, pretest, and fill out the questionnaire
(2) student organizing for learning
(3) guide the inquiry group
(4) presents the results of research projects
(5) analyze and evaluate the problem solving process
(6) students filled out questionnaires, and posttest.

Inter-Intrapersonal Skill

The results showed that basically javanese culture internalization has occurred on student life. Nevertheless internalization during lecturing continuously as material context. Internalization process is embodied in lecture based problem can improve inter-intrapersonal skills. Increase intrapersonal intelligence on each indicator on the experimental class in Figure 1.

Overall, experimental class has scored higher than control class with highest increase on metacognition indicators. Achievement possible because on inquiry stage the students are given a problem to solve, resolve issues when designing experiments ranging from students already trained for appropriate resources and consider such a move is appropriate or not. Similarly, at the trial was designed. In contrast, the lowest achievement on emotional processing indicators occurs due to train feeling that can be fused with problem solved is more difficult.

When implementation, students were asked to identify problem for make design experiments. Similarly, students are required to search journal references to support theory on experimental design will be made. On the steps necessary

willingness to seek a referral, self perseverance, and patience, which essentially this activity students develop intrapersonal intelligence. The results showed an increase in both overall intrapersonal intelligence as well as on each indicator. Result differences occured between control class and experiments class. Acquisition of experimental class scores were significantly higher than control class. The highest increase occurred in metacognition indicator.

At the inquiry stage, students are given a problem to be solved. When solve the problems ranging from making proposals, students will apply their understanding about various things from various information that has been collected as theory study and laboratory work procedures. In this step metacognition indicators will evolve, because thought of a step in the experimental design was appropriate or not. Similarly, at the trial was designed. Report writing and results presentation also have a great opportunity to be able to develop metacognition indicators. This is in accordance with Kipnis opinion (2007) and Cacciatore (2009), which states practicum learning based nquiry can improve student metacognition. Similarly Haryani (2011) express based on his research, that learning begins with a problem solving can improve student metacognition.

Inquiry stage in learning starts from identifying the problem to be created experiment design. Training activities from a variety of sources to identify problems, then determine which issues will be raised in the group, an activity to build self identity. Amarasiriwardena (2007) stated that based on his research, that project based learning will increase the student in recognizing problem from knowledge acquired in the classroom. Similarly, Nugent and Kunt, (2008) and Wiyanto (2005) stated inquiry-based learning will improve students ability to identify problems.

Emotional indicators processing exercised involves feelings in order to consolidate with the problem. In the meantime, practice developing research data into a new invention to develop self reflection activities. On the exercise for a few journals that can be used as basis theory, the effort required earnest and heartfelt. This step also developing javanese culture of alon-alon waton kelakon and diligently.

Although still high category in achievement, values indicator clarification also growing in inquiry proceedings of which at the time gave a description about choice of basic theory from experimental design chosen by each group. But it is quite difficult part so the result is low classified.

Improved interpersonal intelligence of each indicator from experiments class compared with control class shown in Figure 2. Experimental class scored more higher than control class. The highest increase on the indicator giving feedback, while the lowest is in team building. At the inquiry stage, students are given a problem to be solved. At the time of solving problems ranging from planning an experiment, experiment until a report, students are trained regularly to discuss, receive input friends and modified to suit yourself. In this chain of events, Giving feedback is being exercised. How members of the group contribute for developing activities are part of team building.

Cacciotore (2009), Lazear (2004) and Kipnis (2007) found that practicum learning based inquiry can improve student metacognition and develop teamwork. Further submitted that means also improve interpersonal intelligence. This is a form of javanese culture internalization agawe santosa pillars. The results further showed a positive correlation between javanese culture with inquiry activities.

To the state before lecture, both students in experimental class and control class alike have had a javanese culture base and used as a support practicum lectures. But the experimental class that implement problem based inquiry activities, turns out to be more intensive cultural internalization woke up, resulting in a higher awareness of culture as indicated by a significant difference based on the results of testing with t-test.

The Increasing of Conceptual understand

Improved inter-intrapersonal skills turned out to have an impact on increasing student concepts mastery. T test results showed that increasing concepts mastery (from pre to posttest) experimental group greater than control group and significantly differed. The difference can be seen in Figure 3. Nevertheless, an increase in both groups was in moderate category (< 30% N-gain < 70).

Based on interviews and observations to experimental class student activities, revealed that student apparently too preoccupied with his research activities, so rather forget concept mastery. According to students, takes the stage as concepts review related to practicum after practicum activities completed.

Student Responds

Generally student has positive respond to developed lectures model. 70.7% students were very pleased with the lectures strategy implementation, 16.6% said happy while the remaining states disagree. Students does not agree on the strategy adopted for the course must often consult with faculty, so it takes out the lecture schedule. However, students felt had fun doing research and hopes to be applied to other practicum, as well as experience in elektrometri learning based inquiry laboratory activities very useful for later school learning developing.

Effective communication is an important part that should be developed in learning for prospective teachers, because this capability needs to have teachers in exercising his profession function. In this case the teacher plays an important role to be occurrence of communication in education field, which in narrow scale was learning in the class. Lowest achievement problem formulate as well as students not used to problem formulate, allegedly opportunity to problem formulate only in step proposal writing. Minority students who are less avail the facility of direct communication with faculty is a challenge for lecturer to find another strategy. One of the main suggestion is open an online learning service.

4. Conclusion

Based on the research can be concluded that elektrometri lectures based inquiry laboratory activities can build student inter-intrapersonal skills. The development of this capability supported by javanese culture internalization process as alon-alon waton kelakon, nastiti ngati-ati, tenacious, diligent, patient, honest (for intrapersonal skills) and santosa agawe

harmonious culture, mutual assistance, ojo dumeh (for interpersonal skills).

Development of inter-intrapersonal skills has contributed to increased student concept mastery, which significantly shows the acquisition difference between experimental group (innovative model applying) and control group (group practicum models without inquiry). Minority students still feel that used these strategies constrained time to consults. Efforts that can be implemented to overcome this is by online consulting services.

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Figure Legend

Figure 1. The percentage of every indicators of Intrapersonal skill at control and experimental classes.
Figure 2. Interpersonal intelligence indicator score between the experimental class and the control classes.
Figure 3. The average of pretest, posttest, and % N-gain of the experimental and control classes.