

The Influence of Character and Creativity Initiative (CCI) Learning Approach and Lecturers Qualification towards the Learning Results of Program Design Method after Controlling the Mathematics Logic Ability

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Abstract—The research was aimed at implementing the Character and Creativity Initiative (CCI) in education and finding out the description about the professionalism of lecturers' performances in order to increase the students' learning achievements, as well as finding out the students' learning results on program design method. The method used in this research is experiment by using 2 x 2 design factorial. The hypothesis of the research was tested by using Analysis Covariance (ANCOVA). 128 students from Informatics Technical Study Program of Technical Faculty UNIS Tangerang were included as the subjects of the research. The data were collected by using a research instrument on the learning results of program design method and an instrument on mathematics logic ability. The results of this research showed that 1) The implementation of Character and Creativity Initiative education in program design method lecture can increase the students learning results based on good learning plan, execution, and evaluation, and 2) Character and Creativity Initiative (CCI) learning approach taught by certified lecturers can increase the students learning results on program design method.

Keywords—character and creativity initiative; lecturers qualification; learning results of program design method

I. INTRODUCTION

The learning objective of a lecture is an aspect that needs to be considered in learning planning. The importance of it is caused by the fact that it will lead the learning result to the achievement of the expected competencies. Learning is directed at the existing taxonomic regions. They are cognitive, affective, and psychomotor [1]. To get a good result in learning those three taxonomic regions are integrated into a learning objective. Thus, achieving graduate competency as the ultimate objective in the learning activity is able to be achieved.

Competency-based education that includes curriculum, pedagogy, and learning process emphasizes the standards of results. The implication of applying competency-based

education is appearing the need of developing the syllabus and learning systems and it will make students being able to understand the material and having skills in accordance by established standards.

Character is the ownership of things. It is good in the form of discipline, consequence, having fighting power, caring for the environment and others, being confident, polite, and others that can be conducted in the all activities of teaching and learning process to be effective and enjoyable [2]. The purpose of character education is to allow and help students in developing their good attitudes in the manner of intellectual, personal, and social [3]. Cut Zahri Harun in his research stated that character education has a higher meaning than moral education because it is not only related to correct or false, but how to instill habits about good things in life, so children are able to have high awareness, understanding, care and commitment to set virtues in their daily lives [4]. While Ajat Sudrajat stated that lecturers must bind the students with activities that will lead them to think critically about ethical and moral issues, inspire them to be loyal to ethical and moral actions, and provide opportunities for them to practice ethical and moral behavior [5]. It is appropriate to the previous research related to character education. Mutaqin stated in his research on the implementation of character education in programming-based learning to improve student soft skills. The results of the study concluded that the implementation of character education in programming lectures was carried out in the implementation of character values through the selection of methods, learning resources and learning media and affective. Both students' abilities can be improved through the development of character values in the form of worship obedience, honesty, discipline, responsibility, caring and cooperation in project-based programming learning activities [6].

Lecturers are professional educators and scientists who have the main task to transform, develop and disseminate

science, technology, and art through education, research, and community service [7]. In learning the goal is to motivate educators for focusing on three domains in creating a holistic form of education [8]. The one-way learning is outdated, the traditional classroom must be rearranged. It can be started by changing the position of the seat, from the old-fashioned position into the form of seeing each other back to facing each other, in order to make the students being able to work together in teams. That skill is needed in the twenty-first century [9]. As educators, lecturers are supposed to teach about moral directly to build the conscience of students, and habits of behavior. Being able to have a character means being the best person. Therefore, building the character means developing it by ethical potential and intellectual potential.

If lecturers invest time and energy in developing the educational programs, they will be able to improve the students' teaching and learning process. Academic learning beliefs will increase if character education from campus is able to improve the quality of relationship between lecturers and students, also between students and each other, thereby improving the environment for teaching and learning, and both character education efforts include strong academic programs in teaching student skills and the habit of working hard and making a part their education.

According to the research related to the professionalism of the work of lecturer by Asep Priatna about the effect of professional development and lecturer performance on improving student learning achievement, concluded that lecturer performance in the field of education and teaching includes the development of teaching materials, student guidance, teaching methodology, interaction communication with students, and conducting lectures, as well as lecturer professionalism. Discipline, responsibility, work intensity, initiative and honesty, give positive results to their performances in improving education and teaching for students [10].

According to previous studies in this field, we decided to study the influence of the character and creativity initiative learning approach and lecturer qualifications on the learning outcomes of program design methods, after controlling the students' mathematical logic skills in the Informatics Engineering Study Program at the Faculty of Engineering, Syekh-Yusuf Islamic University, Tangerang. We wanted to know whether the learning approach of character and creativity initiative and lecturer qualifications affect the learning outcomes of program design methods.

II. METHOD

The method used in the research was the experimental method. The variables in the study consisted of dependent variables and independent variables. The dependent variable was learning the program design method, while the independent variable consisted of one treatment variable and one attribute variable. The treatment variable was the learning approach which consisted of the Character and Creativity Initiative (A1) approach, and the Realistic Mathematic Education (A2) approach, while the attribute variable was the

lecturer qualification, which consists of certification lecturers (B1) and lecturers not yet certified (B2).

The four independent variables as a whole became the experimental class. Before conducting the experiment, the mathematical logic abilities measurements were taken from students, both the students group who became the experiment and the control group. Therefore, students' mathematical logic abilities could be expressed as covariate variables.

The research sample was the 128 students from four classes of the third year student in the Informatics Engineering Study Program, Faculty of Engineering taken by cluster random sampling technique. Muhammad and Djaali stated that the study sample was determined by cluster random sampling technique [11]. The first step was determining the four classes of the six classes as the experimental class, and obtaining classes a, b, c, and d, from the four classes. It was assumed that the class had the same characteristics as proven by class conditions, the learning curriculum used, the semester learning plan, lecture units, learning facilities.

The research instruments used to obtain data in this study were consisted of: results of learning program design methods, and mathematical logic abilities. The content validity was assessed first by asking for responses, suggestions, and views of panelists who had experience in the matter, before the instrument was used. Then, the instrument was tested and validated to obtain valid instrument items.

III. RESULTS

A. Character and Creativity Initiative Learning

The learning outcomes of the student's program design methods taught by the Character and Creativity Initiative learning approach obtained some points. The points were the highest score of 94 and the lowest 61 in the range of 33, the average value of 75.52, modus 74.41, median 74.77 and standard deviation 7.53.

According to the data, it was able to be seen that there were 13 (20.31%) respondents who were below the interval class with a mean score, 18 (28.12%) respondents who were in the average interval class, and 33 (51.57%) respondents who were above the average school interval class.

B. Lecturer Professionalism

The learning outcomes of the program design methods of students whose certification lecturers obtained the highest score of 94 and the lowest 61 in the range of 5, the average value of 76.84 mode .76.17 median 76.5 and standard deviation 6.95.

Based on the data, it was being able to be seen that 24 (37.5%) respondents were below the interval class with a mean score, 20 (31.25%) respondents were in the average interval class, and 20 (31.25%) respondents were above the average score interval class.

C. Testing of Prerequisite Analysis

1) *Test for normality*: Normality test was conducted to find out whether the data from each group populations are

normally distributed or not. Data normality test was tested by Liliefort test technique. Normality testing using significance level $\alpha = 0.05$ with $n = 32$, and L_{table} value = 0.111, and $n = 64$, L_{table} value = 0.157.

The table showed that all groups of learning outcomes of student program design methods that were tested by Liliefort test technique. It showed a value of $L_0 < L_{table}$ at the significance level $\alpha = 0.05$ with $n = 30$, and $n = 60$. It was able to be concluded that all groups of learning outcomes data program design methods for students from populations were normally distributed, thus the prerequisites for normal data could be fulfilled.

2) *Homogeneity test: The hypotheses tested were:*

$H_0: \alpha_1^2 \leq \alpha_2^2$ (variance between the two groups was homogeneous)

$H_1: \alpha_1^2 > \alpha_2^2$ (the variance of the two groups was not homogeneous)

a) *Test homogeneity between sub-populations of the learning approach:* The calculation results obtained $F_{count} = 1.742$ with the largest variance 56.7778 and the smallest variance 32.587 and F_{table} values (0.05; 63; 63) = 1.809. So that $F_{count} = 1.742 < F_{table} = 1.809$ then H_0 was accepted. It was able to be concluded that between sub-populations the learning approach had the same or homogeneous variance.

b) *Test homogeneity between lecturer qualification sub-populations:* The calculation results obtained $F_{count} = 1.738$ with the largest variance 50.8896 and the smallest variance 29.277 and F_{table} values (0.05; 63; 63) = 1.809. So that $F_{count} = 1.738 < F_{table} = 1.809$ then H_0 was accepted. It was able to be concluded that among the lecturer certification sub-populations the same or homogeneous variance.

c) *Linearity testing:* Regression linearity test was conducted to test whether the covariate X regression model for Y non-free variables was linear or not, because in inferential statistical testing with ANCOVA required the X covariate regression equation model for Y variable to be linear, the hypothesis tested:

$H_0: Y = \alpha + \beta x$ (linear regression)

$H_0: Y \neq \alpha + \beta x$ (nonlinear regression)

Linearity test used a significance level of $\alpha = 0.05$ with testing criteria. H_0 was accepted if the value was $\text{sig.} > \alpha$, and rejected H_0 if the value was $\text{sig.} < \alpha$.

The results of processing data using SPSS obtained the sig value. According in the line deviation from linearity of it was $0.835 > \alpha = 0.05$. It meant that H_0 was accepted, then the regression model influenced the ability of students' mathematical logic towards learning outcomes in a linear patterned program design method.

d) *Test the significance of the regression effect:* Meaning of regression effects to determine whether the covariate variable of mathematical logic ability (X) has an influence on the dependent variable (Y) the results of learning the program design method. Meaning test of the effect of

regression using calculations with the help of the SPSS program,

The hypotheses tested are:

$H_0: \beta_1 = 0$

$H_0: \beta_2 \neq 0$

The significance test of the regression effect uses a significance level $\alpha = 0.05$ with the test criteria if $F_{count} < F_{table}$ then H_0 was accepted. Calculation results were calculated using SPSS. Based on the calculation, it was known that $F_{count} = 133,546 > F_{table} = 2,675$, then H_0 was rejected. Sig value = 0,000 $< \alpha = 0.05$ then H_0 was rejected. The meaning was that the variable ability of mathematical logic significantly influenced the results of learning program design methods.

e) *Test the alignment of the regression lines:* The regression line alignment test was intended to determine the difference in the linear effect of mathematical logic ability (X) on the learning outcomes of the program design method (Y), between the four cell groups formed by the learning approach factor (A) with lecturer qualification factors (B). The regression line alignment test was carried out by SPSS, testing using the heterogen direction (heterogeneous slopes) test.

The model was used to test the hypothesis as follows:

$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4$

$H_1: \text{Not } H_0$

Based on the results of the test using SPSS, it can be seen that $F_{count} = 0.968$ and F_{table} (0.05; 3; 128) = 2.675 at the significance level $\alpha = 0.05$. So, $F_{count} = 0.968 < F_{table}$ (0.05; 3; 128) = 2.675, meaning H_0 was accepted, the value of sig. = 0.410 $> \alpha = 0.05$ then H_0 was accepted. The meaning of it was that the four lines were parallel.

3) *Testing of Hypotheses:* The research hypothesis testing was conducted by inferential analysis. The analytical model was two-way covariance analysis. It was used to test: A mean difference in the deviation of results learning the program design method in the group formed by the learning approach (A) and two mean differences in the learning outcomes of the program design method in the group formed by lecturer qualifications (B).

a) *Results learning program design methods groups of students taught by the Character and Creativity learning approach after controlling mathematical logic abilities: The statistical hypothesis one is as follows:*

$H_0: \mu A_1 \leq \mu A_2$

$H_1: \mu A_1 > \mu A_2$

The results of testing one hypothesis showed that the value of $F_{count} = 6.308 > F_{table}$ (0.05; 1; 123) = 3.915 with a significance level of $\alpha = 0.05$. It meant that H_0 is rejected, thus it could be concluded that there were differences in the average learning outcomes of program design methods a group of students who were given a character and creativity initiative learning approach.

The results of the analysis showed that the corrected average score of the learning outcomes of the program design method for students given a learning approach to character and creativity initiative was 75.375 while the average score for students given realistic mathematical education learning approaches was 73.125.

It could be concluded that the results of learning program design methods in a group of students who were given a character and creativity initiative learning approach were higher after controlling for mathematical logic abilities.

b) The results of learning program design methods are groups of students taught by certification lecturers, after controlling for mathematical logic skills: The two statistical hypotheses are as follows:

$$H_0: \mu B_1 \leq \mu B_2$$

$$H_1: \mu B_1 > \mu B_2$$

The results of testing the two hypotheses showed that the value of $F_{count} = 28,367 > F_{table} (0.05; 1; 123) = 3.915$ with a significance level of $\alpha = 0.05$ means that H_0 was rejected. It could be concluded that there were differences in the average learning outcomes of program design methods group of students taught by certification lecturers.

The results of the analysis showed that the corrected average score of the learning outcomes of the program design method in the group of students taught by certification lecturers was 76,656 while the average score in the group of students taught by non-lecturers certified 71,844. It could be concluded that the results of learning program design methods in the group of students taught by certification lecturers were higher after controlling for mathematical logic skills.

IV. DISCUSSION

This study was aimed to obtain an overview of the influence of the learning approach and the qualifications of lecturers on the learning outcomes of the program design method after controlling the students' mathematical logic skills. The results of the study showed that the learning approach variable (A) and lecturer qualifications (B) had a significant effect on the learning outcomes of the program design method (Y) after controlling the students' mathematical logic skills (X).

A. Results of Learning Program Design Methods a Group of Students Taught with the Character and Creativity Initiative Learning Approach, After Controlling for Mathematical Logic Abilities

The results of the research hypothesis testing proved that there were differences in the average learning outcomes of the program design methods of student groups taught using the character and creativity initiative learning approach with groups of students taught using realistic mathematical education learning approaches. The meaning was that the learning outcomes of student group program design methods taught by a character and creativity initiative learning approach was higher.

Concluded, in the course of learning the program design method in the Informatics Engineering Study Program at the Islamic University of Sheikh-Yusuf where the research took place, was found that the learning approach of character and creativity initiatives was higher in achieving learning outcomes.

B. Results of Learning Program Design Methods Student Groups Taught by Certification Lecturers (B1) More After Controlling Mathematical Logic Abilities

The results of the research hypothesis testing proved that the differences in the average learning outcomes of the program design methods of student groups taught by certification lecturers were able to be accepted. It could be meant that the learning outcomes of program design methods for student groups taught by certification lecturers were higher after controlling mathematical logic skills.

In conclusion, the course of learning the program design method in the Informatics Engineering Study Program at the Islamic University of Sheikh-Yusuf where the research took place, was found that the certification qualifications of lecturers were higher in terms of achieving learning outcomes.

V. CONCLUSIONS AND SUGGESTIONS

The data from research results obtained using instruments that had been compiled, tested hypotheses, could be concluded: Character and Creativity Initiative learning approaches can improve student learning outcomes. Lecturers who have been certified have more success in improving student learning outcomes.

Noting the research conclusions, it could be suggested: To improve the learning outcomes of the program design method, lecturers are advised to use the Character and Creativity Initiative approach that can provide creations and initiatives in understanding the program design method. In order to improve the learning outcomes of program design methods, the role of management in the selection of lecturers who teach courses in program design methods, the faculty institution is expected to hold training related to the learning approach to the lecturers.

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