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The Application of Dick and Carey Learning Design toward Student's Independence and Learning Outcome

Johanes Sapri, Nesna Agustriana
Fakultas Keguruan dan Ilmu Pendidikan
University of Bengkulu
Bengkulu, Indonesia
Johan_sapri_z17@yahoo.com, nagustriana@unib.ac.id

Raden Gamal Tamrin Kusumah
Fakultas Tarbiyah dan Tadris
State Islamic Institute of Bengkulu
Bengkulu, Indonesia
raden@iainbengkulu.ac.id

***Abstract*—The purpose of this research was to describe the application of Dick and learning design in the course of ICT Design and Multimedia as well as instructional impact and it's accompanied as learning outcomes for students. The design used in this study is Classroom Action Research (CAR) with steps of planning, implementation, observation, and reflection which is consisting of 3 (three) cycles. The subjects of this research were sit in the second semester (even) students, consist of 32 students. Data collection techniques are written tests to measure "instructional effects" or mastery of Multimedia Design and ICT lecture materials. Whereas to see the "impact accompaniment" technique used is observation. The results of the research can be summarized as follows. First, application of learning design dick and carey can actualize the impact of instructional and accompanying student learning outcomes through steps; a) needs analysis to determine goals, b) conduct learning analysis, c) analyze students and their environment, d) formulate specific objectives, e) write down performance goals (learning objectives), f) develop learning strategies, g) develop learning materials, g) designing & developing formative evaluation, and h) revising the learning. The application of the Dick and Carey learning design is very effective to actualize instructional impacts as a result of learning Multimedia and ICT Design courses for second (2) semester students of Education Technology University Bengkulu. This is probably because the learning design has a systematic process in teaching and learning processes.**

Keywords—Dick and Carey strategy; instructional impact; accompanying impact; learning outcomes

I. INTRODUCTION

The implementation of effective, efficient, relevant and quality learning should be well designed. Planning is the main guide in the implementation of classroom learning. The planning that is prepared does not make the lecturer, and the instructors become complicated and difficult to conduct the learning process from the subjects even in the classroom subjects, as stated by Majid that "... more important is the planning made must be carried out easily and on target" [1].

Related to learning plan, Dimyati and Amri explain, "Learning plan plays an important role in guiding lecturers to conduct tasks as educators in serving the learning needs of their students [2]. Learning plan is intended as a first step before the learning process takes place".

Learning as a system consists of components of goals, materials, methods, tools / media, and evaluation. Some of these components are often ignored by teachers. There is a statement from certain lecturer that teaching in the classroom is easy or not difficult ... "take a textbook from a course or subject that will be taught in class, also take a whiteboard marker to write on a whiteboard, with only speaking method of teaching, then lecturer can conduct learning in the class until the end of the allocated time in the learning schedule ".

The results of the author's observation in the implementation of learning in the Educational Technology Master's Study Program, many problems were identified, among others; not all lecturers have made a design (plan) of learning before the conducting of the learning process in the classroom in several courses in the Academic Year that will be entered, especially in the Multimedia Design and ICT courses.

Dick, Carey, and Carey has an opinion that the learning design as a system and assume learning is a systematical process. In reality this systematical work method is expressed as an approaching system model. It was emphasized by Dick, Carey, and Carey that the systems approach always refers to the general stages of the Instructional Systems Development (ISD). this was also discussed by the Snelbecker in his book on instructional theory [3,4].

Talking about design issues, it goes into the process, and if using the term instructional design (ID), it refers to instructional system development (ISD), namely the stages of analysis, design, development, implementation and evaluation. Instructional design is the umbrella field [3]. The Dick and Carey model components including; learners, students, material, and environment.

For courses that do not have learning design, it will be difficult for students to gather learning resources that will be accessed so that the scope and sequence of material based on the order of learning objectives are unknown to students. Classroom learning patterns in theoretical (face-to-face) and practice (product-making) courses are not directed at students.

In the determination of the mid-test and the Semester Final Examination, students are often unknown, sometimes based on the frequency of meetings not based on the scope of the material that has been submitted to students. There should be guidelines for the scope and sequence of material based on the order of learning objectives at each face-to-face meeting. This design learning has suitable with Pribadi [5].

According to Dick, Carey, and Carey that the design of learning as a system and assume learning is a systematic process. In reality, this systematic work method is expressed as an approaching system model. It was emphasized by Dick, Carey, and Carey that the systems approach always refers to the general stages of the Instructional Systems Development (ISD) system [3].

The stages used are planning, development, evaluation, and process management. While the basic components of the system include learners, objectives, methods, and evaluations which are further developed into 9 (nine) learning design plans. There are ten steps in learning Dick and Carey showing a very clear, unbroken relationship between one step to another [3].

In an effort to fix and improve the quality of learning in the Study Program of Education Technology Master, Teaching and Education Faculty University of Bengkulu (FKIP UNIB), the researchers will compile "Application of Strategy-Based Learning Design Dick and Carey in Multimedia and ICT Design Courses and Instructional Impacts and Accompaniment as a Learning Outcome (Study in the Student of Study Program Master's Degree Educational Technology, University of Bengkulu).

In general, the main problem that will be researched is "How is the Implementation of Strategy-Based Dick and Carey Learning Design in Multimedia and ICT Design Courses as well as Instructional Impacts and Accompaniment as Learning Outcomes at the Students of Educational Technology Master of Teacher Training and Education of Bengkulu University?" Specifically, this research aims: 1) how the process of implementing the Strategy Based on Dick and Carey Learning Design in Multimedia and ICT Design Courses in the Educational Technology Master's Degree Program FKIP UNIB, 2) how the effectiveness of the impact of implementation as a result of Dick and Carey's Strategy-Based Learning in Multimedia ICT Design Courses in the Study Program Master's Degree Student Educational Technology FKIP UNIB?

In general, the purpose of this study was to produce Dick and Carey Strategy-Based Learning Design in Multimedia and ICT Design Lectures in the Students of Educational Technology Master Program FKIP UNIB. Specifically, the objectives of this study are as follows: 1) describe the process of implementing Dick and Carey Strategy-Based Learning design in Multimedia ICT Design Lectures in the Educational Technology Master's Degree FKIP UNIB, 2) describe the effectiveness of the impact of implementation as a result of Dick and Carey Strategy-Based Learning in the Multimedia ICT Design Lecture in the Environment of Master of Education Technology FKIP UNIB.

II. METHOD

The design used in this research is Classroom Action Research (CAR), with steps of planning, implementation, observation, and reflection consisting of 3 (three) cycles. The subjects of this research were the second semester (even) students class of 2015/2016 academic year Master's Degree of Education Technology University of Bengkulu totaling 32 students. Data collection techniques are written tests to measure "instructional effects" or mastery of Multimedia Design and ICT lecture materials. Whereas to see the "impact accompaniment" technique used is observation

Data analysis techniques, referring to the opinion of Sugiyono that, data analysis is the activity of grouping data based on variables and types of respondents, tabulating data based on variables and types of respondents, presenting data for each variable under study, performing calculations to test the hypothesis that has been proposed [6]. The data in this research obtained data from direct observations on research objects to reveal increasing students' understanding. Direct observation is conducted in the beginning of learning in the classroom and when given the treatment of applying Dick and Carey Strategy-based learning in CAR classes. Furthermore, it will be analyzed the effectiveness of the implementation of Learning Design based on Dick and Carey Strategy in the course of ICT Design and Multimedia in the form of learning outcomes of educational technology master's degree students FKIP UNIB through basic statistical analysis. Qualitative data is processed through steps: data reduction, data display, verification and conclusions. Qualitative data is processed using simple statistics, namely percentage (%). Next, compare the instructional and accompanying effects between the "t test" (different test) research cycles.

III. RESULTS AND DISCUSSION

Based on data processing and research analysis in first cycle shows that the application of Dick and Carey Strategy in the learning of Multimedia & ICT Design Courses that should be able to actualize the instructional and accompanying effects of student learning outcomes in the ICT Multimedia Design Course second semester has not shown the expected results. This can be seen from the activities of lecturers in teaching that they cannot fully implement what has been planned, this event also occurred in the research activities carried out by Juita and Julaila to their students [7,8]. It happens because the lecturers are still used to be conducted learning in a conventional style, namely the lecturer is still a "center" in learning and everything is still centered on the lecturer so that students are still passive objects, not active subjects. While the tools, media and sources prepared by the lecturers have not been fully utilized in learning. Another condition that appears is the inefficient use of time, especially in the transition situation between classical learning and groups. learning should be more teacher asking open ended questions and more stimulating discussion between students. Effective questioning and listening skills are important for successful teaching [9].

The results of the research in first cycle, the instructional and accompanying effects are still lacking, this can be seen from the still large dominance of the lecturers in conveying

learning which results in ineffectiveness of the classroom atmosphere which causes students to remain inactive such as chatting, not discussing and processes learning is still dominated by smart students. It is not suitable as Thursan and Sardiman said in his book that effective learning should be has interactive situation in the classroom [10,11].

Based on the observation sheet of the instructional and accompanying effects, the recapitulation of instructional impact indicators and their accompanying learning in the first cycle is at an average of 74.34 which is enough category. From the results of the mentioned observations, it can be concluded that overall in the first cycle, the instructional and accompanying effects are not in accordance with what was expected. The involvement of lecturers still dominates the course of learning so that students feel unnoticed and there are one-way learning and only the lecturer holding power. In addition, learning is only dominated by clever students and unclever students only as spectators, sit down, chat and instead of discussion, this incident is very common because most Asian students tend to be passive in class [7,8,12]. This indicates that in the first cycle, the increase in instructional and accompanying impacts is still not in accordance with what is expected, so it needs improvement in learning carried out in the second cycle.

From the mentioned conditions, the student involvement becomes less optimal. This is shown from the learning outcomes of students who have not reached the minimum standard scores (KKM) of 70 and the results of the instructional impact observer and accompanying sheets which show only 60%. These scores prove that learning in the first cycle has not been successful and there needs to be improvement.

Judging by student learning outcomes, there have not been better results, because there are several students who have not yet completed. Post test scores obtained by students after the first cycle of learning are carried out, are still below the minimum completeness criteria applied by the lecturer, namely 70. The recapitulation of student completeness in the first cycle of Classroom Action Research (CAR) class can be seen in table 1.

TABLE I. RECAPITULATION OF STUDENT LEARNING COMPLETENESS IN FIRST CYCLE

Number	Description	Pre Test	Post Test
1.	Total of Students	32	32
2.	Highest Scores	70	78
3.	Lowest Scores	50	60
4.	Average Scores	62.03	70,40
5.	Number of students that have not been completed		11
6.	Number of students that have been completed		21
7.	Percentage of Completeness		34,37 %

From table 1 it can be explained that the application of the Dick and Carey Strategy in an effort to improve learning independence and student learning outcomes obtained the highest score achieved by students 78, the lowest score was 60, the average value of students was 70.40, with a completeness percentage of 65.625%. These results indicate that in first cycle, classically students have not reached completeness, because classically students who get > 70 grades only reach 65.625%, and individually completeness there are still 11 students who have not yet completed, because these students get scores under the completeness criteria the minimum set is 70.

In the second cycle, the instructional impact and accompanying learning began to increase. This can be seen from the instructional and accompaniment impacts as student learning outcomes are good. In this cycle, no more students were chatting they were quite enthusiastic in participating in learning because the lecturer began to focus learning with a series of questions and tasks that aroused students' motivation so that students generally were responsible for the assignments given by the lecturers. However, even so, the dominance of smart students still exists. And not all students seem independent in participating in learning and doing assignments or discussions given by the lecturer.

Based on the observation sheet of the instructional and accompanying effects, the recapitulation of instructional impact indicators and their accompanying learning in the second cycle is at an average of 89.81, which is the good category.

From the description of the above processing results, it can be concluded that the instructional and accompanying effects in the second cycle have shown improvement, but this is not in accordance with what is expected, which is seen in the analysis phase of the inquiry process which is presenting the results of group discussions, still dominated by smart students, so other students are seen just sitting still and listening. From these conditions, it can be said that the involvement of students in learning is not fully maximized. This indicates that in the second cycle, the improvement in instructional and accompanying effects is good but not in accordance with what is expected, so that it needs improvement in learning carried out in cycle 3.

Judging from the acquisition of student learning outcomes, it has shown better results, because there are no students who have not been completed, because the post-test scores obtained by students have met or above the minimum completeness criteria applied by the lecturer, namely 70. The student post-test scores on the second cycle CAR classes can be seen in table 2 below.

TABLE II. RECAPITULATION OF STUDENT LEARNING COMPLETENESS IN SECOND CYCLE

Number	Description	Pre Test	Post Test
1.	Total of Students	32	32
2.	Highest Scores	78	90
3.	Lowest Scores	60	70
4.	Average Scores	70,46	78,28
5.	Number of students that have not been completed		-
6.	Number of students that have been completed		32
7.	Percentage of Completeness		100 %

From table 2, it can be explained that the application of Dick and Carey Strategy in learning to improve the independence of student learning outcomes is the highest score

achieved by students 90, the lowest score is 70, the average score of students is 78.28 and the completeness percentage is 100%. These results indicate that there is a significant increase compared to the first cycle, classically students have achieved completeness, because classically students who get > 70 reach 100%, and no students are not completed because there are no students who get scores below the completeness criteria the minimum (KKM) that has been set is 70.

The next finding is that there is an increase in student learning outcomes in first cycle, and second cycle. This can be seen in table 3 below.

TABLE III. T-TEST POST-TEST FIRST CYCLE AND SECOND CYCLE

	First Cycle	Second Cycle
Average	70.40625	78.28125
t – count	12.93831519	t-count
t – table	2.039513438	t-tabel

From the table 3, the results of the calculation t-test significant level are 95% and the degree of freedom (db) = 31 obtained t_{count} = 12.93 and t_{table} = 2.039. Because $t_{count} > t_{table}$, then, null hypothesis (H_0) is rejected, and the alternative hypothesis (Ha) is accepted. This means that there is a significant difference between student learning outcomes and the application of Dick and Carey Strategy on ICT Multimedia Design learning in first cycle and second cycle in CAR classes.

t-test results prove that there are differences in student learning outcomes with the application of Dick and Carey Strategy in first cycle and second cycle in CAR classes, in second Semester ICT Multimedia Design courses students of Master's Degree of Education Technology University of Bengkulu.

The implementation of the action in the third cycle is the application of constructivist strategy in the course of Multimedia ICT Design in second semester Master's Degree Education Technology students of FKIP UNIB. In third cycle, producing instructional and accompanying effects in learning and doing assignments has experienced a significant increase. All students are involved in learning. The discussion process went well and was no longer dominated by smart students. Student motivation in learning and doing assignments is good. Self-confidence and responsibility, have really been seen in students. This can be seen when students present the results of the discussion, where all students in the group are quite actively involved with high self-confidence. This is because students have understood the material delivered by the lecturer so that they are not afraid and doubtful in completing and answering the questions and assignments given.

Research findings related to instructional and accompanying effects in third cycle 3 are in the average of 99.96 which is the good category. The involvement of students in the learning process has been maximally seen from their activeness and independence. The sense of responsibility of students in conducted assignments has greatly improved. The discipline of students in acting also shows that they are already independent with their duties. The dominance of smart students is no longer visible. All students are fully involved in learning. This indicates that in the third cycle, the improvement in instructional and accompanying impacts is good in accordance with what is expected, so there is no need to improve learning in the next cycle.

Judging from student learning outcome, it has shown better results, all students have obtained completeness in learning which is marked by the post test scores obtained by students have met or above the minimum completeness criteria applied by the lecturer, namely 70. The student post-test scores on this third cycle can be seen in table 4 below.

TABLE IV. RECAPITULATION OF STUDENT LEARNING COMPLETENESS IN THIRD CYCLE

Number	Description	Pre Test	Post Test
1.	Total of Students	32	32
2.	Highest Scores	90	95
3.	Lowest Scores	70	75
4.	Average Scores	78,40	82.96
5.	Number of students that have not been completed		-
6.	Number of students that have been completed		32
7.	Percentage of Completeness		100 %

From table 4, it can be explained that the application of Dick and Carey Strategy in learning to improve the independence of student learning outcomes is the highest score achieved by students 95, the lowest score is 75, the average score of students is 82.96, and the percentage of completeness is 100%. These results indicate that there is an increase compared to the second cycle, classically students have reached completeness, because classically students who get > 70 reach 100%, and no students are not completed because no student has a score below the minimum completeness criteria (KKM) is 70.

Interpretation of t-test data for the post-test of second cycle and post-test of third cycle can be seen in table 5 below.

TABLE V. T-TEST POST-TEST SECOND CYCLE AND THIRD CYCLE

	Second Cycle	Third Cycle
Average	78.28125	82.96875
t – count	5.47	
t – table	2.039	

From table 5, From the results of the calculation t-test significant level of 95% and the degree of freedom (db) = 31 obtained t_{count} = 5.47 and t_{table} = 2.039. Because $t_{count} > t_{table}$, the null hypothesis (H_0) is rejected, and the alternative hypothesis (Ha) is accepted. Means that there are significant differences in student learning outcomes with the application of the Dick and Carey Strategy on Learning Multimedia Design ICT in second cycle and third cycle in 2nd Semester (CAR class).

The results of the t-test prove that there are significant differences in student learning outcomes with the application of

constructivist strategies in learning Multimedia Design and ICT in second cycle and third cycle 2nd Semester (CAR class). The application of Dick and Carey Strategy in learning can actually improve student learning outcomes in Multimedia Design and ICT courses. According to Mctaggart, learning at the end of the learning cycle, learning outcomes usually increase if many factors support [13].

IV. CONCLUSION

Based on the research results above, the application of Dick and Carey strategy-based learning in Multimedia Design and ICT courses through certain steps has very effective in actualizing instructional impact as a result of learning Multimedia Design and ICT courses for second semester master's degree students of FKIP UNIB. The implications of the results of the research is the lecturers can apply the Dick and Carey learning strategy in various courses, including those applied to Multimedia Design and ICT courses, taking into account the following matters; analyze the need to set goals, analyze learning, analyze student characteristics and the environment, formulate specific goals, write down performance goals (learning objectives), develop learning strategies, develop learning materials, design & develop Formative Evaluations, and revise Learning. The application of Dick and Carey strategy-based learning can bring instructional and accompanying impacts on Multimedia and ICT Learning Design courses in the student of Master's Degree of Education Technology FKIP UNIB. This finding implies that the factors that have a role when the lecturers conduct learning is the difficulty of choosing the right strategy related to goals, materials, tools and media, and evaluation. Because each learning strategy will be closely related to learning as a system.

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