Learning outcomes through the cooperative learning team assisted individualization on research methodology’ course

N F D B Pakpahan
Faculty of Engineering, Universitas Negeri Surabaya, Indonesia
nurmiapkahan@unesa.ac.id

Abstract. All articles must contain an abstract. The research methodology is a subject in which the materials must be understood by the students who will take the thesis. Implementation of learning should create the conditions for active learning, interactive and effective are called Team Assisted Individualization (TAI) cooperative learning. The purpose of this study: 1) improving student learning outcomes at the course research methodology on TAI cooperative learning. 2) improvement of teaching activities. 3) improvement of learning activities. This study is a classroom action research conducted at the Department of Civil Engineering Universitas Negeri Surabaya. The research subjects were 30 students and lecturer of courses. Student results are complete in the first cycle by 20 students (67%) and did not complete 10 students (33%). In the second cycle students who complete being 26 students (87%) and did not complete 4 students (13%). There is an increase in learning outcomes by 20%. Results of teaching activities in the first cycle obtained the value of 3.15 with the criteria enough well. In the second cycle obtained the value of 4.22 with good criterion. The results of learning activities in the first cycle obtained the value of 3.05 with enough criterion. In the second cycle was obtained 3.95 with good criterion.

1. Introduction
Research methodology is a lecture that must be taken by students before making thesis or scientific research. Material research methodology constitutes the materials supporters that are to be understood by students to finish the thesis. The thesis is the duty of the end of scientific research written by a student to meet the requirements got a degree. This indicates of understanding of material research methodology a decisive factor in seeking success students finish the thesis [1].

Based on observation and experience researchers, almost 28 % students academic year 2010 in the department of civil engineering still has yet to complete a thesis, and have reached ending time of his studies. One of a contributing factor is a student do not have an understanding that supports its ability to develop a proposal thesis (plan research) and implement research. It means, students have never had the capacity who capable in making proposal research or proposition thesis, because they have not yet had a good understanding in preparing the problem who want to study, moreover about procedure research. Learning that is teacher-centered consisting of the as a source of information and learning dominated by teachers, less member opportunity to school tuition to develop the ability of diverse. As a result school tuition less play an active role in learning, and created atmosphere active and democratic.

Problems now of how to implement learning that can be pushed students to hurry to understand matter research methodology as a basis supporting the completion of thesis students. The application of learning that would improve livelihood students and expected to improve study results is learning model cooperative type Team Assisted Individualization (TAI) [2]. Learning model aims to address a
learning disability students individually. Learning activities more used to problem-solving, typical of type TAI this is every student individually learn matter learning already prepared by lecturers. Learning outcomes individual brought to groups to discuss and mutual discussed by members of the group, and all members of the group liable to all answers as the responsibility of us all. After going through a learning process it is hoped that students get the result of learning which satisfactory. According to Slavin [2], a method of TAI is a program pedagogical who are trying to adopt learning by taking into account individual differences student all at academic. The purpose of TAI to minimise individual teaching is ineffective, and an increase of knowledge, skill, and motivation the student to study in a gregarious manner.

Based on background above it can be formulated the following problems: 1) How to increase the learning outcomes of students after implementation of cooperative learning with TAI on research methodology’ course in the Department of Civil Engineering Universitas Negeri Surabaya?; 2) How to increase the teaching activities in class after implementation of cooperative learning with TAI on research methodology’ course in the Department of Civil Engineering Universitas Negeri Surabaya?

2. Basic Theory

2.1. Cooperative learning type Team Assisted Individualization (TAI)

Cooperative learning-type Team Assisted Individualization (TAI) according to Helda [3] is a combination of learning, collaborative learning with individual learning. Gradually, each member of the group given the problems they have to do it yourself first. After that assessment is carried out together in groups. If reserved the first stage had been completed properly, then every student do some problems in the next stage.

According to Slavin in a Huda [2,4], TAI is a program pedagogical trying to adopt learning by fine distinctions individual student all at academic. TAI development can support the practices of the classroom, as grouping students, grouping ability in the classroom, teaching program, and learning based on computer. The purpose of Team Assisted Individualization (TAI) to minimise teaching individual that has proved less effective, in addition, to increase knowledge, ability, and motivation of students in a learning group.

Excess of TAI in Slavin: 1) improve learning outcomes students; 2 ) increase the motivation to study for on the self-student; 3 ) decrease treatment that annoys; 4 ) program or this model can get help students who are weak. The feebleness of TAI according to Slavin among other: 1 ) it takes a long time to make and develop a device of learning; 2 ) as the number of students that is great in a class, the teacher will have any difficulty in provides guidance to the students; 3 ) not all matter be able to apply the TAI use; 4 ) cause dependency students where students who less clever indirectly would depend on the students well [2].

2.2. Learning outcomes

According to Gagne [5], learning activity was complex. Learning outcomes in the form of capabilities. After having learned people skills, knowledge, attitude, and value. The emergence of the capabilities of stimulation is derived from the environment and the cognitive process conducted by learners. Thus learning is a set of the cognitive process that changes the nature of environmental stimulation, passing of information processing, become capital new. Piaget next contends that the knowledge formed by the individual. For individual conduct continuous interaction with the environment. That environment undergoing change. With the existence of interaction with environment intellect hence function keeps growing.

According to Bloom [2,4,6], learning outcomes includes: 1) cognitive domain, covering knowledge (knowledge, memory), comprehension (understanding, explains, summarizing, example) , application (applying), analysis (outlines , ascertaining the relations ), synthesis (organize, plotting, forming new buildings), and evaluation (assess); 2) domain affective, covering receiving (attitudes receiving), responding (give a response), valuing (value), organization (organization), characterization; 3) psychomotor domain, covering initiatory, pre-routine, and routinized. Psychomotor also includes skills, productive, technique, physical, social, managerial, and intellectual.
Domain cognitive covering [4,6]: 1) memory or knowledge (knowledge), namely the ability remember a material that has been learned; 2) understanding (comprehension), namely the ability catch understanding, translate and interpreting; 3) the application of (application), namely the ability to use a material that has been learned in a new situation and real; 4) analysis (analysis), namely the ability identify and connecting among parts to build a whole; 5) synthesis (synthesis), namely the ability concluded and united a separate piece to build a whole; 6) an evaluation, namely the ability study value or the price of something, as a statement or research reports based a criteria [7].

Based on the definition of above, can be taken the conclusion that study results are a result of learning activities that transformed the student competency on the knowledge.

3. Methodology of research

3.1. Location and time research
This research was conducted at the Department of Civil Engineering, Faculty of Engineering Universitas Negeri Surabaya in the odd semester of academic year 2013/2014. Data collection was conducted in September 2016 until November 2016.

3.2. Subject and object research
This study uses the subject of the action (principal subject) that 30 students of Building Technical Education, which is the programmed course of research methodology. The subject broadcaster is lecturer research methodology. Whereas the object of this research is the application of Team Assisted Individualization (TAI) cooperative learning.

3.3. Research methods
References used in the Classroom Action Research is a model Kemmis and MC Taggart [7]. Steps models such as the following picture.

![Figure 1](image_url)  
**Figure 1.** Step classroom action research, a model Kemmis dan M.C Taggart [7,8]

3.4. Methods of data collection
This study uses the instrument: (1) an instrument learning outcomes tests, (2) observation sheet activities of lecturers presenting cooperative learning type TAI on course research methodology [9].

Learning outcomes tests were analyzed using the criteria required that 75% of the students master the material tests or obtain a minimum score of 75. Learning outcomes tests conducted in each cycle, if the student's understanding achieved as required, then the cycle will be completed action.
4. Result and discussion
4.1. Results of research

4.1.1. Learning Outcomes. The student learning outcomes related to intellectual indicated by the value obtained after completing the test. Cognitive competence of students after applied Problem Based Instruction [10,11] can be seen in the following table.

Table 1. Frequency distribution of student learning outcomes -test scores on application of cooperative learning type TAI cycle to cycle

| Score Interval | Cycle 1 Frequency | Cycle 2 Frequency |
|----------------|------------------|-------------------|
| 0 - 30         | 0                | 0                 |
| 31 - 54        | 1                | 0                 |
| 55 - 74        | 9                | 4                 |
| 75 - 89        | 13               | 16                |
| 90 - 100       | 7                | 10                |
| **Number**     | **30**           | **100**           |

Table 2. Recapitulation of learning outcomes on application of cooperative learning type Team Assisted Individualization cycle to cycle

| Exhaustiveness | Cycle 1 Frequency | Cycle 2 Frequency |
|----------------|------------------|-------------------|
| Non            | 10               | 4                 |
| Complete       | 20               | 26                |
| **Number**     | **30**           | **100**           |

Criteria for the achievement of learning outcomes is a score $\geq 75$. That is, the students are said to have competence when it got a score of at least 75. In the table indicated that the percentage of learning outcomes in cycle 2 with the implementation of cooperative learning Type Team Assisted Individualization to reach $86.67\% \geq 75\%$. It shows that most of the students have managed to achieve complete, as many as 26 students from 30 students. While students are not complete in learning outcomes are 4 students or by 13.33%.

References
[1] Jackson N 1978 Civil Engineering Materials (Hongkong: ELB & MacMillan)
[2] Slavin R i cols 1984 Combining cooperative learning and individualized instruction: Effects on student mathematics achievement, attitudes, and behaviours Elem. Sch. J. 84 409–22
[3] Helda T and Elizabeth N Steeps in the Action Research in the Action Research Reeder (Victoria Australia: Deakin University)
[4] Huda M 2015 Cooperative Learning (Yogyakarta: Pustaka Pelajar)
[5] Gagne R M and Leslie J B 1979 Principles of Instructional Design (New York: Prentice Hall Inc.)
[6] Isjoni 2011 Cooperative Learning (Bandung: Alfabeta)
[7] Kember and David 2000 Action Learning and Action Research (USA: Kogan Page Limited)
[8] Rukmini E 2016 Deskripsi Singkat Revisi Taksonomi Bloom
[9] Khasinah S 2013 Classroom Action Research J. Pionir 1 107–204
[10] Nur M 2004 Learning Strategies (Surabaya: Center for Science & Mathematics School)
[11] Nur M 2000 Problem Based Teaching (Surabaya: University Press: Universitas Negeri Surabaya)