Increasing Students’ Self-Efficacy Through Realistic Mathematics Education in Inclusion Classroom

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Abstract. The purpose of this study was to influence changes in student self-efficacy mathematics in inclusion classroom through realistic mathematics education. Student activity in inclusion class in learning has been designed in hypothetical learning trajectory, using research design stage, measurement of student self-efficacy, improvement in inclusion classroom through questionnaire, interview and observation to find the factors influencing self-efficacy, to see the characteristics of students in inclusion classroom which has high and low self-efficacy and see the average score of self-efficacy of students in each trial through 3 dimensions classified by Bandura that is level, strength, and generally, the results obtained in this study is self-efficacy influenced by Culture, level of tasks assigned, external Intensive, Role in the environment and Information about Self-Esteem that determines trust in themselves.

1. Introduction

Children with disabilities are provided with special education facilities matched with their degrees and types of disabilities. Unconsciously this education system has built exclusivity for children with disabilities and hampers the process of getting to know each other between children with disabilities and non-disabilities. As a result of social interaction in the community, disabled groups become socially isolated communities [1]. Along with the growing demand of disability groups in voicing their rights, the concept of inclusive education was initiated by the Convention on the Rights of Person with Disabilities and Optional Protocol, the Convention states that each country has an obligation to administer an inclusive education system at every level of education.

Inclusion education is an education service system where children with disabilities learn in the nearest schools in the classroom with their peers. Thus, inclusion education provides services to all children regardless of conditions of mental, intellectual, physical, social, economic, and emotional, in which all children learn together according to the conditions and needs of each child [2]. So many positive things that happen, one of which is the emergence of students’ self-efficacy in the face of learning and problems both at school and outside.

Self-efficacy is a person's ability to do something and the effective behavior, feelings and beliefs of a person to his ability [3]. Individuals with high self-efficacy are committed to solving the problem and
will not give up when they discover that the strategy being used is not successful [4]. Individuals who have high self-efficacy will be very easy to face challenges. Individuals do not hesitate because he has a belief that is full of his ability. This individual will quickly face problems and be able to rise from the failures that he experienced.

Someone who has a high Self-Efficacy will always try to do various actions and ready to face difficulties. Individuals with high self-efficacy in the face of unresponsive environmental situations will intensify their efforts to change the environment, whereas individuals with low self-efficacy in unresponsive environmental situations, individuals tend to feel apathetic, resigned, and helpless [5], students with high self-efficacy can complete the tasks performed better than those with low self-efficacy [6]. High self-efficacy learning has a better quality of learning strategy and has more self-monitoring of learning outcomes than low self-efficacy.

Improving self-efficacy needs innovation and alternatives. One of the keys and changes the strategy of teachers in providing motivation to learn, in this case, realistic Mathematics Education is one of the appropriate learning method to improve student self-efficacy in inclusion classrooms. In the realistic framework of Mathematics Education, Freudenthal states that “mathematics is human activity”, therefore mathematical learning is suggested to depart from human activity. Technically, a realistic approach is not viewed as "ready-made" knowledge, but "math is human activity." Learning is no longer merely the provision of information in mathematics teaching, but transformed into human activity to gain knowledge. The significance of concept in the main thing is realistic Mathematics Education. A knowledge will be meaningful for students if the learning process is implemented in a context or learning using realistic problems. A realistic problem should not always be a real-world problem (realworld problem) and can be found in everyday life of the student. A problem is called "realistic" if the problem is imagineable in the mind of the student [7]. However, most educators only provide learning based on non-interactive handbooks and do not support the improvement of students' mathematical self-efficacy. For that purpose a special way for children with disabilities in inclusion is needed in order to grow their self-efficacy through realistic Mathematics Education.

2. Method
Research method to be used in this research is a design research, consists of three phases, namely: preliminary design, experiment, and retrospective analysis.

2.1 Preliminary design
In this phase, hypothetical learning trajectory is designed based on anticipation of what might happen to the students. It needs to be done the study of relevant literature, discussions with educators who have experience in learning, and who are involved in this research and discussion with expert researchers in the field. Hypothetical learning trajectory consists of three parts, namely: learning objectives, learning activities (learning process practices), and learning process hypotheses that will occur [8].

2.2 Experiment
Designs that have been designed are tested in order to see whether the anticipated things in the preliminary design phase are appropriate or not in fact. The experiences that occur in this phase will be the basis for redesigning or modifying the hypothetical learning trajectory for the next learning process. The function of hypothetical learning trajectory in this phase is to focus on learning process activities, observation, and interviews.

2.3 Retrospective Analysis
In this phase, all data obtained from the previous phase were analyzed. The process of analysis is the comparison between hypothetical learning trajectory anticipated before learning experiments and real-life activities occur, followed by an analysis of possible outcomes, and a synthesis of possible possibilities.
The learning process is done by finding the learning concept of square and rectangular area which is done by asking the disabled students in the inclusion classroom to cut the paper the size of 1 x 1 cm and cover all the rectangular surface objects to get the concept of the area of a rectangular object.

Students are asked to gather objects around them that are square and rectangular, and present the results of their measurements in order to train their self-confidence, learning outcomes and then analyzed using self-efficacy questionnaires

3. Dimensions of Self-efficacy
According to Bandura, self-efficacy for a particular task varies along with three dimensions: level, generally, and strength, although the level of a task influences one's degree of self-efficacy[9].

3.1 Level
Students' self-efficacy in doing a task differs in the degree of difficulty task. Individuals have high Self-efficacy on easy and simple tasks as well as on complex tasks and require high competence. Individuals who have high Self-efficacy tend to choose tasks that have a difficulty level in accordance with its ability.

3.2 Generally
This dimension relates to the individual's mastery of the field or job task. Individuals can claim to have self-efficacy on a wide range of activities, or are limited to certain dominant functions alone, individuals with high Self-efficacy will be able to master multiple fields at once to complete the task. Individuals who have low Self-efficacy master only a few of the areas required to complete the task.

3.3 Strength
The third dimension is more emphasis on the level of strength or ability of individuals to believe. Self-efficacy indicates that the actions taken by individuals will produce results that are appropriate to the expected individual. Self-efficacy is the basis for doing great work, even when facing obstacles.

From the above explanation it can be concluded that Self-efficacy includes dimensions Level, Generally and Strength. Self-efficacy one's beliefs about their ability to produce performance levels, confident in their own abilities, and strong commitment, viewing adversity as a challenge or thinking about strategy in experiencing difficulties in new situations, setting themselves challenging goals, diligent and trying maximally, having to deal with failure, focus on the task and not easily despair of failure.

4. Description of Student’ Self-Efficacy Enhancement
Data obtained from the questionnaire of student self-efficacy were analyzed to find out the increase of student self-efficacy by comparing the average score of students obtained. Description of improving self-efficacy of students trained with realistic mathematics education.

| Dimension | Indicators | Trial I | Trial II | Trial III | Trial IV |
|-----------|------------|---------|----------|-----------|----------|
| 1 Level   | Individual beliefs about ability to difficulty level of task | 37,25   | 37,33    | 37,39     | 37,42    |
|           | Selection of behavior based on obstacles or difficulty level of a task or activity |         |          |           |          |
| 2 Strength| The degree of strength of individual beliefs or rewards to their abilities | 36,08   | 36,31    | 36,36     | 36,44    |
| No | Dimension       | Indicators                                                                 | Trial I | Trial II | Trial III | Trial IV |
|----|----------------|---------------------------------------------------------------------------|--------|---------|----------|---------|
| 3  | Generality     | Individual confidence in the ability to perform tasks in various activities | 47.14  | 47.22   | 47.27    | 47.33   |
|    |                | Average self-efficacy questionnaire score                                 | 40.16  | 40.28   | 40.34    | 40.39   |

The average score of the self-efficacy questionnaire increased in each trial, indicating an increase in student confidence measured by level, strength, and generality using a questionnaire and supported by interviews on the subject and research note. The low self-efficacy of a person in each task varies greatly. This is due to the presence of several factors that influence the perceived ability of one's self, these factors are:

a. Culture
Culture influences the factors through values, beliefs and self-regulatory processes that serve as a source of self-efficacy assessment as well as the consequence of self-efficacy beliefs.

b. Difficulty level of task
The level of difficulty of the task faced by each individual will affect the individual’s judgment on his own ability. The more complex a task the individual faces the lower the individual will judge his ability. Conversely, if the individual is stuck on an easy task, the higher the individual will judge his ability.

c. Externally Intensive
Another factor that affects the individual's self-efficacy is the intensive it acquires. One of the factors that can improve self-efficacy is able to encourage all possibilities (competent contingent incentive), i.e., intensive given by others who reflect on success.

d. Roles in the environment
Individuals with higher status will gain greater degree of control so that their Self-efficacy is also high whereas individuals with lower status will gain a smaller degree of control so that their self-efficacy is also low.

e. Information about Self-efficacy
Individuals who have high self-efficacy, if they get positive information about him, while individuals who have low self-efficacy, if he obtained negative information about himself.

In performing tasks, individuals who have high self-efficacy will tend to choose to engage directly and tend to have a calm feeling in the face of difficult problems, while individuals who have low self-efficacy tend to avoid the task and have a narrow vision of what is best to solve problems. Characteristics of individuals who have high Self-efficacy have the following characteristics: 1) Can handle effectively the situation that they face. 2) Time to succeed in overcoming obstacles. 3) Threats are seen as something to be avoided. 4) Persistent in trying. 5) Believing in self-ability possessed. 6) Habit of hesitation. And 7) Likes to find new situations.

Characteristics of individuals who have low Self-efficacy has the following characteristics: 1) Slow in correcting or regaining Self-efficacy when failure. 2) Not sure to face obstacles. 3) Threats are seen as something to be avoided. 4) Reduce effort and quickly give up. 5) Doubt on self-ability possessed. 6) Dislikes to seek new situations and 7) commitment to weak tasks.
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