



The Effect of Self-Efficacy on Technical Skills in Collaborative Instruction

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Abstract

Self-efficacy is an important factor in determining learners' achievements and influences the choice of learners' activities. This study was conducted with the aim of explaining the effect of self-efficacy on technical skills in collaborative instruction. Efficacy consists of 24 question items with the lowest score of 24 and the highest score of 120 for categories of high self-efficacy and low self-efficacy. The subjects of this study were vocational students in the NTT province, especially in the Audio Video Technique class with 80 students. The study results are differences of the concept of learners who have high self-efficacy with low self-efficacy, and there are differences in learning outcomes of students who have different self-efficacy. From the results of research, it was concluded that collaborative instruction helps students who have low self-efficacy to obtain the improvement of learning outcomes.

Keywords: Collaborative Instruction, Self-Efficacy, Technical Skills.

Introduction

Instructional strategy in the 21st century refers to cooperation and collaboration in problem solving. Therefore, based on the demands of education in the 21st century the characteristics of vocational school graduates have work-ready skills in terms of teamwork. To meet these demands, the development of this cooperation needs to be initiated at the level of the classroom environment.

Exercise skills or life skills should be given to learners from the beginning, as early as possible. This is as exercising and living together with another person or in group activities, through collaborative learning situations or environments in schools is needed; with one of the objectives in class being the preparation for success in the workplace.

Low levels of student participation in the learning process can be caused by various factors. Bandura in his research revealed that there is a factor called self-efficacy which refers to "a person's beliefs about her abilities to learn or perform actions at specified levels" (Bandura, 1977). Based on the self-efficacy of a person, they can plan and implement actions that lead to the achievement of specific objectives, according to the decision (judgment) of a person of their ability. In other words, in performing certain tasks, self-efficacy is the belief of self-assessment with regard to the competence of a person to be successful. So, by Bandura, self-efficacy is the "key factors source of human action (human agency) on what people think, believe, and feel that affect how they act".

Self-efficacy also affects a person's actions, how much effort they take, how long they will persevere in the face of obstacles and failures. According to Pajares (1997), the behaviour can be predicted by predicting a person's perceived self-efficacy. Further, Pajares revealed that specific self-efficacy tended to occur in areas of study or specific skills. He also said that the various settings achievements produce diverse effects caused by self-efficacy.

This study will examine the relationship of self-efficacy with cognitive learning. Efficacy in this study was adapted from an instrument developed by Muris (2001), which consists of 24 question items covering 8 items of academic efficacy questions, 8 items of social efficacy questions, and 8 items of emotional efficacy questions. The cognitive learning, which will be its association with self-efficacy, is obtained by the test scores of students of class X Engineering Audio Video for subjects Fixing Radio.

Self-efficacy reflects a person's level of confidence in fulfilling certain tasks. According to Bandura (1977) self-efficacy is the decision (judgment) of a person for his ability to plan and carry out actions that lead to the achievement of certain goals. In other words, the level of self-efficacy is the belief of self-assessment with regard to the competence of a person to succeed in the task.

Correlation of self-efficacy with learning outcomes: According to Bandura (1977), self-efficacy beliefs are the key factors in the source of human action (human agency) on "what people think, believe, and feel that affects how they act". Self-efficacy beliefs also affect a person's actions, how much effort they take, and how long they will persevere in the face of obstacles and failures. According Pajares (2002), the behaviour can be predicted by predicting a person's perceived self-efficacy (Zajacova, Lynch, & Espenshade, 2005).

Efficacy in view of the Social Cognitive Theory: the construct of self-efficacy describes the core aspects of social cognitive theory (Bandura, 1977, 2000, 2001). Experts' social cognitive theory assumes that the level of self-efficacy is the key variable that influences learning self-regulation (Schunk, 1981). In support of this assumption, the perception of self-efficacy learners is found to be associated with the two key aspects of the repetition of the reciprocal (reciprocal loop) on the feedback submitted, namely the use of learning strategies and self monitoring. Some studies found that the perception of self-efficacy is positively related to the learner's learning outcomes as task persistence (Zimmerman & Ringle, 1981), choice task (Bandura & Schunk, 1981), a study of effective activities, and academic presentations.

Self-efficacy as an Indicator of Success Learning: Efficacy in several studies showed an association with academic achievement (Pajares, 1997). Learners who have low self-efficacy for learning may avoid the duty, whereas learners who rate themselves with high confidence are more likely to be eager in doing the task (Schunk, 1990).

From this, it can be concluded that learners who observe and relate it to their own abilities are successful in that their self-efficacy increases. Whereas when they believe that they are less capable, and they are not able to achieve their own ability, they may not be motivated to study harder. Self-efficacy beliefs can affect individuals to perform successfully and have conduct necessary to obtain the desired results (Shkullaku, 2013). When humans have strong feelings of self-efficacy, they will go ahead and make a greater effort to fulfill or complete the task and dispel the obstacles they face, than people who have a weak sense of efficacy (Zajacova et al., 2005). Thus, learners who have a higher self-efficacy will have a higher intention anyway and are more likely to keep working on the task, despite facing obstacles from the outside (Choi, 2005).

Methods

Research Design

The design used for the implementation of this study was based on the factorial 2x2 design of the non equivalent control group design version (Tuckman, 1999). Factorial design is defined as a structure of research in which two independent variables or more are confronted to examine the consequences independently and interactively with a dependent variable (Kerlinger & Lee, 2000). This factorial design can treat two or more independent variables at the same time. This design divides groups according to the number of groups to be studied. To analyse the data based on this factorial design, the ANOVA (Analysis of Variance) technique is used (Tuckman, 1999) and refers to (Kerlinger & Lee (2000).

Research Variables

Independent variables are variables that are measured, manipulated and predicted that affect the dependent variable. The independent variables referred to in this study are two-dimensional collaborative strategies, namely: (1) Questioning Reciprocal Peer learning and (2) Group Collaboration Learning. Both of these variables are variables that can predictably the affect of the dependent variable.

The moderator variable in this study is self-efficacy. This is a variable that is not manipulated and predicted to affect the relationship between the independent variable and the dependent variable. This variable of self-efficacy consists of two dimensions, namely: (1) high self-efficacy, and (2) low self-efficacy.

Dependent variables as variables whose existence is influenced by independent variables, need to be observed and measured for changes caused by independent variables. The dependent variable in this study is students' technical skills.

Some other variables (controlled variables) that are thought to interfere with the effect of treatment results include: (a) Teacher characteristics and qualifications, (b) Instructional material facilities, (c) Students' initial abilities, and (d) The allocation of time and student activities.

Learning Devices and Research Instruments

To compile learning devices, the authors consulted with the caregiver class learners of the subjects being studied. Devices compiled in the form of Syllabus, RPP are tailored to the strategies being used, the teaching materials and the student worksheets. To implement this instrument, the development of instruments related to the process of preparing research instruments and testing instruments, related to the trial process of instruments to obtain research instruments that meet the elements of validity and reliability, are carried out.

Development of Research Instruments

Instrument of Self-efficacy. The instrument of self-efficacy used was adapted from Peter Muris which consisted of 24 question items where the questions related to self-efficacy which included academically, socially or emotionally motivated students (Muris, 2001). Students, as research subjects, were asked to fill out self-efficacy instruments by choosing one of the 5 (five) answer choices that were appropriate to their situation and condition.

Based on the scoring provisions, it can be explained as follows: In the self-efficacy instrument consisting of 24 items (after the trial), each item has 5 alternative answers with a range of scores from 1 to 5. Therefore, the self-efficacy questionnaire will get the highest total score of 120 and the lowest total score of 24. The highest and lowest scores were determined by two categories of learners, namely students with high self-efficacy (73-120) and students with low self-efficacy (24-72).

Test of Research Instruments: The compiled learning outcomes' instruments were then tested in a class that had completed the lesson material to improve the radio receiver. The purpose of testing this instrument was to obtain research instruments that fulfilled the elements of validity and reliability.

Findings

Out of 82 students involved in the study, 42 students entered the high efficacy category with a percentage of 53.66% while those with low self-efficacy were 38 students or 46.34%. The research subjects were distributed based on learning strategies and self-efficacy, combined in the form of cross tabulation (crosstabs), and the distribution of the number of research subjects for each treatment group is shown in table 1.

Table 1. Subject of research

		Instructional Strategy		
		Reciprocal Peer Questioning	Group Cooperation	Total
Self-efficacy	High	25 students 32.25 %	17 students 21.25 %	42 students 52.50 %
	Low	15 students 18.75 %	23 students 28.75 %	38 students 47.50 %
Total		40 students 51 %	40 students 50.00 %	80 students 100 %

Table 2. Descriptive Statistics for Self-efficacy and Technical Skills

eTechnical Skills	<i>Reciprocal Peer Questioning</i>	High	85.56	6.863	27
		Low	78.13	6.567	15
		Total	82.90	7.586	42
	Group cooperation	High	81.76	6.769	17
		Low	81.78	6.987	23
		Total	81.78	6.807	40
	Total	High	84.09	7.001	44
		Low	80.34	6.972	38
	Total		Total	82.35	7.195

Technical skills for high self-efficacy mean reciprocal peer questioning was 85.56, higher than the Group Collaboration of 81.76. While for low self-efficacy, the reciprocal peer

questioning strategy shows a mean value of 78.13 from a Group Collaboration of 81.78. To further clarify the results of the descriptive analysis of the data in table 2, the summary of the research data is the mean values in terms of learning strategies and self-efficacy.

The description of the pre-test data is displayed using histograms pre-test score data of group collaborative learning (reciprocal peer questioning and group discussion) are shown in Figure 1.

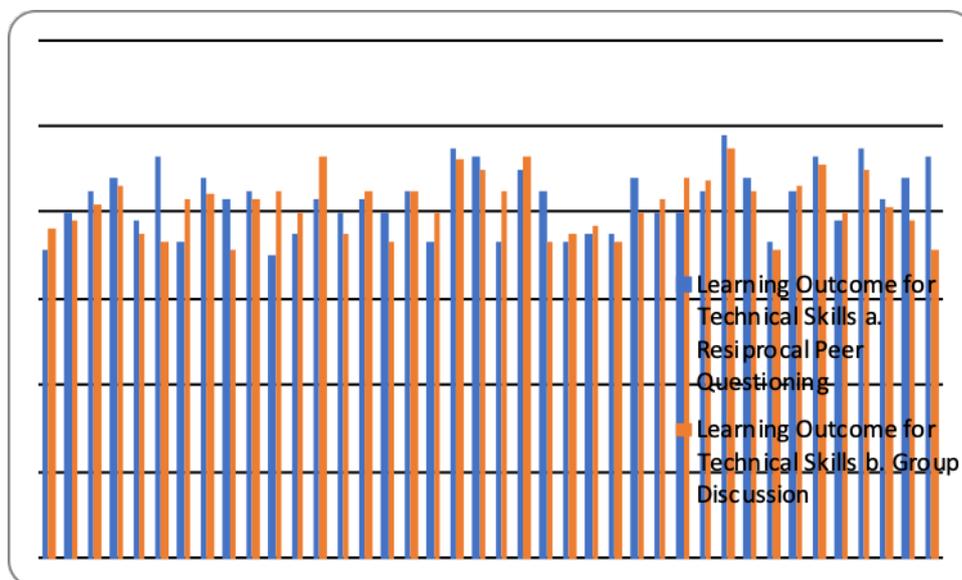


Figure 1. Learning outcomes of Collaborative Learning

For learning strategies on learning outcomes, technical skills obtained an F count equal to 5.710 with a significance probability value of 0.019. Values of significance probability is still far below 0.05. Thus, it can be concluded that H_0 is rejected. This means that there are differences in learning outcomes of technical skills of learners with high self-efficacy with low self-efficacy. Figure 2 shows the fluctuation of self-efficacy in class using group discussion methods and self-efficacy in class using reciprocal peer questioning methods.

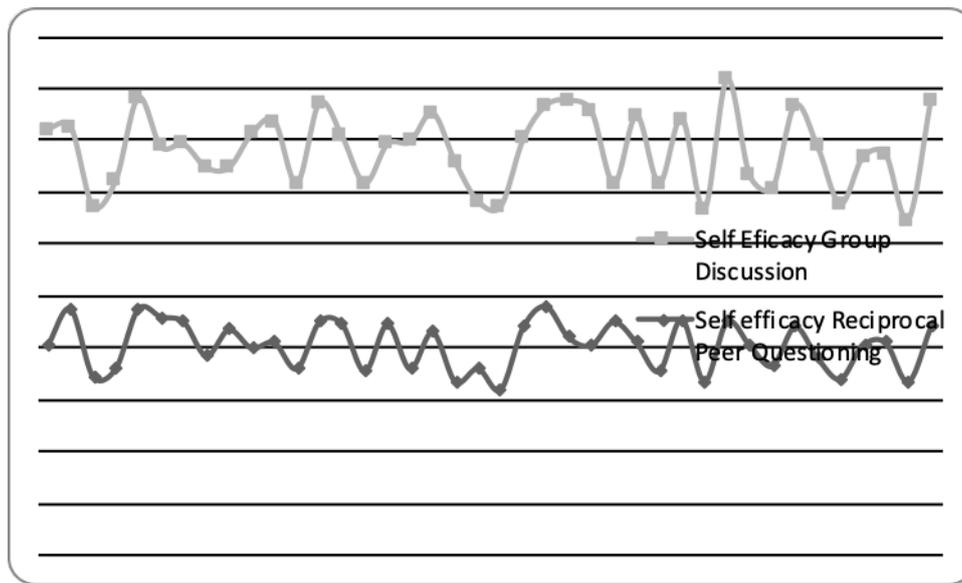


Figure 2. Self-efficacy using Group Discussion and Reciprocal Peer Questioning

If associated with social cognitive theory, that states that learning technical skills is to build a mental model, it provides a conceptual representation of skills to produce a response and serve as the standard for the responses given improvement after feedback is received (Bandura, 1986). In social cognitive theory, internal and external factors are considered important. The events in the environment, personal factors, and behaviour are seen interacting with each other in the learning process (Woolfolk, 2009).

Social cognitive theory also emphasises the role of personal cognition (goals and expectations) in the development of motor skills. Based on the goals and expectations for this then self-efficacy has a significant effect on the improvement of learning outcomes.

Salanova, Lorente, & Martínez (2012) in their discussion prove the hypothesis that higher self-efficacy in learning settings will improve performance in the academic field. Further said that self-efficacy can cause various effects in a variety of settings achievements, and efficacy can influence the choice of activity. People get information about their self-efficacy in a field of the capability of their practices in the field and observations of the models, and forms of social

persuasion. *Prakteik* or actual actions provide the most valid information to assess the efficacy of the self.

Apart from the influence from each variable, based on research data of learners who have the self-efficacy of high gain high results, while those with a lower self-efficacy get the results of high learning, this then indicates that the cooperation strategy adopted in this research helps those with low self-efficacy to achieve better results. This is in line with the study of Revelation, about the influence of self-efficacy with cooperative learning strategies, where the cooperative strategies are used to help improve learning outcomes. Research Sharan (1990) illustrates also that, learners doing the task in a group, teach each other, respect each other, and there will be a better mastery against a subject of learning, than learning to do the task himself. The cooperation strategy group in this study supports that the strategy of cooperation is helping those who have low self-efficacy to achieve better results, especially with regard to technical skills.

Based on research data, it shows that the interaction between learning strategies and self-efficacy towards learning outcomes of technical skills, indicate that the independent variables (learning strategies) and moderator variables (self-efficacy) influence each other on the dependent variable, where each independent variable is not significantly the main influence. Hence, when the learning strategies and self-efficacy interact, both learning strategies and self-efficacy mutual influence the learning outcomes of technical skills. This condition indicates variable learning strategies and self-efficacy variables affect each other. According to Hair, Anderson, Thatam, & Balck (1995) that is the combined effect of the interaction term (joint effect) of the two treatments.

Based on the results of research and discussion of variables in this study, the applicability of the subjects Improving Radio Receivers, had a percentage of 30% theory and 70% practice. The competencies expected after learners complete these subjects are learners who have the competence to repair or refit a radio with the sub competencies of: preparing the repair,

completing the work/repair, watching for signs of damage, allocating the damage, analysing the measurement results, making improvements / repairs, testing the results of the repairs / refits, and reporting on improvements that led to the practice.

The cooperation strategy group, as well as the results of research, show the results in which learners experience the learning outcome. It can be concluded that the strategy of cooperation / collaboration provides enhanced Group Collaboration on learning outcomes. The teacher as a facilitator in the learning process, in applying this method, requires the katif in controlling the process of discussion of the students that more are targeted to the conditions during the learning process. This relies heavily on teachers so that dynamcis happens in the discussion of each group and can be facilitated by the teacher.

This learning strategy requires students and teachers to be active in the elaboration of the material presented by teachers. This is especially for the students who need to seek additional information that enriches their understanding during the process of the learning that takes place.

The presence of differences in learning outcomes of technical skills among groups of students with high and low self-efficacy, provides additional information to the teacher during the learning process. This is shown in the empirical and theoretical support that reinforces that the self-efficacy effect is significant to the learning outcomes and technical skills. The findings of this study, which states there are differences in learning outcomes skills technically, on the subjects of the radio receiver between groups of students who have self-efficacy of high and low can be good information to teachers, parents and all those involved in learning to pay attention and to encourage students to experience that which evokes efficacy themselves and that they are capable of performing the tasks entrusted to them.

The findings of student self-efficacy are one of the dominant factors influencing the dimensions of technical skills so that self-efficacy is very well applied to practical subjects. In order for self-efficacy to be accommodated in the learning process, it is suggested that teachers

and parents need to provide trust in accordance with the needs of students that have an impact on improving their self-efficacy. Even for students with low self-efficacy, they can apply cooperative learning strategies to obtain good results according to the results of the study.

Discussion

Judging from the results of the learning of technical skills, based on the results of hypothesis testing of this study, they indicated that there is no significant difference for the results of radio system technical skills learning between groups of students taught using the Questioning Reciprocal Peer strategy with groups of students who are taught with a strategy of Group Collaboration. This finding is based on the practice data showing that the group of students using the Questioning Reciprocal Peer strategy has an average score of learning outcomes in the mastery of the radio system concept (radio receiver repair subjects) which is almost the same as the average score of learning outcomes of technical skills of students using strategy of Group Collaboration. With the findings of this study, it means that there is no significant difference for the two strategies on the learning outcomes of students' technical skills taught both using the Questioning Reciprocal Peer learning strategy and those using Group Collaboration learning strategies. Thus, for technical skills based on existing results for both of these strategies, both Questioning Reciprocal Peer and Group Collaboration, they both show an increase in value that tends to be the same, and this shows that the two strategies turned out to be equally superior for practical subjects.

The effectiveness of cooperative learning, both through theoretical and demonstration research, and the scientific literature consists of very carefully controlled research studies conducted to validate or to test the theory. This study is one of them in the form of experimental studies in the field, while professional studies consist of semi-experimental or correlational field



studies that demonstrate that cooperative learning does work in real classes for a considerable period of time (David W Johnson, Johnson, & Holubec, 1993).

In theory, in cooperative situations each individual tries to provide something that is beneficial to other individuals and to the group. All students in the group will work for one outcome, and the material can be shared among the learners of its members. Interpersonal interactions with peers so that students can enjoy, are part of the learning process. This is evidenced by the results of a study which proves that the collaboration strategy, in this case learning together, can be applied to technical subjects.

Group Collaboration is needed so that the gathered individuals can interact and cooperate with each other. The reasons for group cooperation are:

1. The results of teamwork can produce more results.
2. Group cooperation provides enthusiasm, satisfaction and happiness for group members.
3. Individual abilities in Group Collaboration can be utilised to improve group performance
4. The success of the group can be achieved through mutual assistance between members of the group.

In an ideal class, all learners will learn about how to collaborate collaboratively with others, compete for fun and excitement, and work autonomously on their own. This skill can be obtained when students are divided into small groups to complete the assignments from the teacher. Students with different backgrounds and conditions are given the opportunity to work interdependently with each other on shared tasks through the use of cooperative rewards, learning to respect one another (D.W Johnson & Johnson, 1991). Vygotsky also emphasised the social nature of learning, and suggested using learning groups with the ability of different group members to seek learning change. Vygotsky's theories support the use of cooperative learning strategies where students work together to help each other learn.

Conclusion

With the differences in technical skills of students who have high self-efficacy with students who have low self-efficacy, it shows that self-efficacy has an impact on technical skills so that subjects that are oriented to the mastery of skills need to consider student self-efficacy. Furthermore, the results obtained from the interaction between learning strategies and self-efficacy on the results of learning technical skills, show that through collaborative learning strategies help those who have low self-efficacy and can be motivated to improve self-efficacy or it can be concluded that the cooperative strategy can improve student self-efficacy and with increased self-efficacy can improve student learning outcomes in technical skills.

Suggestions

To date, based on the results of the study, it was found that the Questioning Reciprocal Peer learning strategy was proven to be effective in improving learning outcomes in the mastery dimensions of the concept and could be applied to practical subjects, so it was necessary to consider it's application to other practical subjects. The strategy of Group Collaboration, based on the results of the study, is as good as the Questioning Reciprocal Peer strategy for material or practical subjects. Further findings of student self-efficacy are one of the dominant factors influencing the dimensions of technical skills so that self-efficacy is very well applied to practical subjects. In order for self-efficacy to be accommodated in the learning process, it is suggested that teachers and parents need to provide trust in accordance with the needs of students that have an impact on improving their self-efficacy. Even for students with low self-efficacy, they can apply cooperative learning strategies to obtain good results according to the results of the study.



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