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RISTEKDIKTI

Self-Regulated Learning (SRL): the Benefits of Learning SRL Techniques Through Training Modules

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ABSTRACT: Self-regulated learning (SRL) is one of the significant factors determining the success of student learning. Every student can be trained to be a self-regulated learner. This paper presents the research relating the benefits of implementing self-regulated learning in students at the Universitas Terbuka (UT), Indonesia. This research is a mixed-method which employed one group design consisting of pre-test and post-test. The SRL training employed learning strategies integrated within an online tutorial. 65 students pursuing Biology Education at UT, in the academic year of 2016, made up the tested population. Although the increases seen were minimal, the results nevertheless indicated an improvement in students' SRL. This finding has applications relevant to university policy, particularly in integrating SRL training within other online courses.

Keywords: distance education, training, self-regulated learning.

1.INTRODUCTION

Self-regulated learning (SRL) is one variable known to affect overall student learning. SRL is defined as a self-initiatived, active and constructive action in which students plan, organize, control, and evaluate their learning process. SRL includes cognitive, metacognitive, behavioral, motivational, and emotional aspects of learning (Panadero, 2017). Students mastering SRL learn faster and have a better academic performance as compared to ones that do not (Kizilcek et al., 2016). To this end, an integrated and coherent SRL model and its relevant training is supported to improve student learning (Panadero, 2017).

Many studies researching the improvement of SRL in students have been conducted. (Lai & Hwang, 2015; Cheng & Chau, 2013). However, investigation of certain methods to enhance SRL, especially for science students, is insufficient. Students lacking SRL skills show relatively low learning outcomes and tend to be inconsistent with their approach. Students at UT, primarily a distance learning institution in Indonesia, are familiar with online tutorial as a learning method. Therefore, training in this specific modality is predicted to improve the SRL for science students at UT.

RESEARCH METHOD

1.1.*Method*

The mixed-method used in this study consisted of a one group design of pre-test and post-test (Cresswell & Clarck, 2007). To determine the effectiveness of online tutorials to improve the students' SRL, differences in ability were calculated by assessments done before and after train-

ing. Any increase of SRL was further delineated as low, medium, or high. Data collection occurred from January to April 2.FINDINGS AND DISCUSSION of 2016. The study population consisted of 65 students in a Biology Education study program at UT, Indonesia in the academic year of 2016, in the courses of Assessment in Biology Learning, Strategy in Biology Learning, Human Anatomy and Physiology, and Animal Development.

1.2. *Data collection*

Data collected of students' SRL was used a modified Motivation for Learning Strategy (MLSQ), with 4 Likert scales, where 1 = never, 2 = rare, 3 = often, and 4 = very often (Rahayu & Widodo, 2017) and assessed both motivation and learning strategies. Measurement of motivation was further defined as both extrinsic and intrinsic and as self-efficacy. Measurement of learning strategies was defined as goal setting, goal accomplishment, objectives in science, monitoring, time management, studying locations, effort regulation, self-evaluation, and self-reflection. The assessment contained 40 valid items, with a Cronbach Alpha reliability of (r) = 8.6 at α = 1%. Students were asked to fill out the MLSQ questionnaire both before taking an online tutorial as well as after.

The SRL tutorial techniques taught included study planning, self-monitoring, self- evaluation, mind mapping, and compiling questions and answers. Integrated training material in the form of a CERDAS book was provided, both in printed and online form One week prior to the online tutorial, students were required to monitor the implementation of their study plan and reflect on the learning process that had occurred. The students were also asked to demonstrate understanding of the concepts through the use of mind mapping and questions and answer formation. Students were interviewed for 10 weeks using guidelines that both explored SRL skills and reinforced and complemented other data.

1.3. *Data analysis*

Data collected was both quantitative and qualitative; SRL scores provided the quantitative data, while qualitative data was obtained from interviews. To measure the differences between SRL ability before and after training, parametric tests using a paired sample of t-test were carried out. The t-test is valuable when the data are distributed normally and have non-homogeneous variance. Normality distribution testing was carried out using the Kolmogorov-Smirnov test. Homogeneity of variance testing was carried out by the Levenes test. To determine the improvement of the students' SRL, a normalized gain score (N-gain) analysis was carried out. The categories of gain values were defined as low (N-gain less than 3); moderate ($0.3 \leq$ N-gain ≤ 0.7), and high (N-gain ≥ 0.7) (Hake, 1998). Data analysis was carried out using SPSS 23 for Windows with a significance level of 5%.

Analysis of the mean difference showed that there was a significant difference between pre-SRL training scores and post-SRL training scores (p-value = 0.00 at α = 0.05). This is comparable to a previous study. Significant differences shown between the students' SRL after training was evident particularly in the self-monitoring parameter of the Biology Learning Strategies course (Rahayu et al., 2017), as well as the self-evaluation and self-reaction parameters of the Human Anatomy and Physiology (Rahayu & Widodo, 2018). Table 1 shows the differences in average score of students' SRL, before and after training.

Table 1 The result of the statistic using a t-test on students' SRL

SRL	N	Mean	T	SD	Std. Mean	Error	p-value
Pre-SRL	65	2.98	-4.19	.25	.031		<0.00
Post-SRL	65	3.21		.34	.042		

An N-gain test was carried out to identify the criteria for SRL improvement, and compared the values of pre and post-training SRL. The value of N-gain was 0.20, indeed showing an improvement of students' SRL, albeit, a low level. Techniques taught in the training modules consisted of scheduling study time, time management, self-monitoring, self-evaluation, mind-mapping and devising question and answers. These were shown to enhance students' SRL, however, the increases were not optimal. Presumably, several possible factors contributed to this. (1) students were not yet familiar with the SRL training that was integrated within the online tutorials; indeed, the frequency and amount of student involvement in SRL training tended to decrease. (2) Longitudinal research has shown that it takes 4 years to improve the study skills of students through SRL training (Wibrowsky et al., 2016). SRL is a learned habitual behavior which requires time to acquire. As such, eight weeks was not long enough to transform the habits, attitudes, and behavior of the students. Therefore, consistency of the tutors and online tutorial programs, in addition to the time required to train, is required in order to improve aspects of SRL, which include motivation, self-efficacy, goal setting, goal accomplishment, self-monitoring, time management, studying location, effort regulation, self-evaluation, and self-reflection.

 56% of the initial 65 study respondents remained involved in the overall online tutorial activities. Although the effect seen was low, involvement of students in implementing the techniques learned from the tutorial training was key. In addition, participants interaction with other students and/or instructors enhanced their SRL (Sun & Rueda, 2012). As supported from their interviews, it was shown that 92% of students found SRL training integrated into the online tutorials to be beneficial for them and 99% of students stated that CERDAS as a material book helped and encouraged them to learn independently and systematically. Time management strategies learned with this systematic method were shown to increase motivation, particularly for distance education students. However, some students reported the tutorial experience to be difficult, and found constraints in applying the learning strategies, namely in the subjects of time management, setting realistic short-term learning goals, self-monitoring, self-evaluation, and mind-mapping.

Benefits seen from applied cognitive and metacognitive strategies did exit, however. During the training, students self-recorded their behavior and learning activities in a schedule. Specifically, they identified which materials had been mastered, the problems that were faced and the possible solutions. The application of reflection and evaluation tasks can help students focus on the goal of building knowledge (Yang et al., 2016). It can also improve students' understanding, reflection and critical thinking skills (Ghanizadeh, 2016). In this study, self-monitoring was shown to help students increase self-awareness of learning strategies.

CONCLUSIONS

The results of this research has shown that SRL training, when integrated within an online learning platform, improves students' SRL, although in the low category. University regulation is needed to support this training, so the students can achieve SRL skills as well as modern-day self-assessment techniques. The implication of this study is that SRL training should be implemented

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to a broader range of courses as it will lead to a gradual improvement of learning readiness and self-regulated learning skills in student populations.