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SELF-REGULATED LEARNING SKILLS OF ELEMENTARY SCHOOL TEACHER EDUCATION STUDENTS DURING ONLINE LEARNING DURING THE COVID-19 PANDEMIC

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ABSTRACT

Abstract: The study aims to investigate the self-regulated learning skills of Primary School Teacher Education students during online learning and explore the relationships between each indicator in SRL skills. Descriptive analysis shows that students highly appreciate the assignments because of their intrinsic and extrinsic motivations. Nevertheless, students lack confidence, especially in mastering content that is complex. Most students have observed and managed the strategies in finding and learning information. The appreciation for tasks was positively correlated with confidence in learning as well as strategies in searching and studying information. Similarly, confidence in learning is positively correlated with strategies in searching and studying information.

Abstrak: Penelitian ini bertujuan untuk mengetahui keterampilan belajar mandiri siswa Pendidikan Guru Sekolah Dasar selama pembelajaran online dan mengeksplorasi hubungan antara masing-masing indikator dalam keterampilan SRL. Analisis deskriptif menunjukkan bahwa siswa sangat menghargai tugas karena motivasi intrinsik dan ekstrinsik mereka. Meskipun demikian, siswa kurang percaya diri, terutama dalam menguasai materi yang kompleks. Sebagian besar siswa telah mengamati dan mengelola strategi dalam mencari dan mempelajari informasi. Apresiasi terhadap tugas berkorelasi positif dengan kepercayaan diri dalam belajar serta strategi dalam mencari dan mempelajari informasi. Demikian pula, kepercayaan diri dalam belajar berkorelasi positif dengan strategi dalam mencari dan mempelajari informasi.

INTRODUCTION

The paradigm shift from teacher-centered learning to student-centered learning has given a major change to the role of learners. They are required to be learners who can control themselves and actively participate in their learning activities. Controlling includes motivation, how to learn, and how to evaluate the actions that have been done to achieve maximum learning results. This shows that learners independently determine and make decisions on what actions should be taken for success in learning (Zimmerman, 1990). Self-regulated learning (SRL) is a regulation carried out by a learner regarding the learning motivation, metacognitive strategies and behavior in the learning process.

The process of learning as part of building knowledge requires an emphasis on the needs of self-regulated learning. Learners with varying levels of initial knowledge, motivation, anxiety, and the ability to manage emotions must have self-regulated learning abilities to be successful in their learning (Hirt et al., 2021). Success in learning is not only determined by the number of insights but evaluation throughout the learning process becomes a foundation for learners to make adjustments and rules so that learning strategies become more effective (Raković et al., 2022). Self-regulated learning in learners supported by SRL personalization can improve the learning achievements (van Alten et al., 2021).

Learning that was previously only carried out offline, now with the development of technology can be done more flexibly, anywhere and anytime (Binali et al., 2021). Online learning in MOOC for example, that provides opportunities for students to determine their learning targets, content of interest, and duration of completion certainly requires self-regulated learning. The ability to manage their own learning is indispensable in massive online learning as it is today (Broadbent et al., 2020; Jansen et al., 2020). As in online learning, learners need to manage not only information or learning resources, but also a learning environment that supports the achievement of learning goals (Maldonado-Mahauad et al., 2018; Wong et al., 2021). This study focused on how students' SRL skills during online

learning and what is the relationship between the indicators of the SRL skills. Information about SRL skills becomes an important part for educators to prepare for online learning better or as material to improve learning that has been implemented before.

Online Learning

During the Covid-19 pandemic, learning at the primary, secondary, and higher education levels has been carried out online (Iivari et al., 2020). Online learning that is packaged using a learning management system that can be done synchronously or asynchronously can still facilitate learners to achieve learning goals with various learning approaches such as collaborative learning through an online learning environment (VanOostveen et al., 2018). When doing online learning, of course, the facilitator must know how the level of self-regulated learning, the willingness to actively participate and how the tendency of learners in appreciating or placing tasks related to online learning (Vanslambrouck et al., 2018). Being able to assess progress or learning difficulties on your own is one of the skills in self-regulated learning. Thus, learners can make adjustments to learning strategies to improve previous learning achievements (Vrieling et al., 2017).

Learning carried out in higher education during the Covid-19 pandemic has shifted from what was originally emphasized on face-to-face learning, now switching to online learning. This online learning can be facilitated by using video conferencing, learning video recordings, materials that can be accessed online, or online discussions (synchronous / asynchronous) (Favale et al., 2020). The use of learning management system provides its own convenience for lecturers to manage learning activities, organize learning materials, collect assignments and even assessments (Maqableh & Alia, 2021).

Online learning has several advantages. The advantages when viewed from the aspect of effectiveness, online learning does not require much time for mobilization from residence to campus, saving transportation costs, and can be done anywhere. In other words, online learning is more flexible. Secondly from the security aspect, online learning lowers the risk of traffic accidents, preventing the spread of viruses. Third, in the aspect of convenience, time lag between learning in online learning can be used to do homework activities, learning can be done anywhere. Fourth, learners have higher confidence in participating than when studying face-to-face (Al-Nasa'h et al., 2021) as well as the ease in the organization of learning materials either in the form of video recordings or other electronic materials (Fidalgo et al., 2020).

Online learning also has some drawbacks. In the aspect of learning support, especially such as the environment or conditions around students if not conditioned properly, it will make it easier for the emergence of distractions to focus on learning. The presence of lecturers who can be replaced with video media can also reduce the focus of students. Because of learning in the classroom is now only as a support and learning from home as the main activity, online learning is felt to tend to burden students with more tasks. For learners who are in areas with less supportive internet coverage, they will have difficulty in online learning. Interaction with lecturers and friends is often only done online, so direct interaction is difficult to do (Fidalgo et al., 2020).

In addition to the advantages and disadvantages that have been explained in the previous paragraph, students also face several other problems during online learning. Mental health, time management, lack of interaction and communication with peers, and difficulty in balancing between time to learn and time for other life routines (Kapasia et al., 2020). The lack of direct interaction between lecturers and students, students and students during online learning causes gaps. This can be facilitated by online discussions involving collaboration between students so as to create cognitive collaboration (Darabi et al., 2011)

As with learning activities in the classroom, online learning also needs to be managed appropriately so that the engagement of learners can be maintained. Various defense strategies can be applied in online learning such as inquiry-based learning, case-based learning, debate, project-based learning, collaborative, role playing, reviewing articles, facilitating by lecturers or peers, as well as expert lectures (Sadaf et al., 2021). Management of the online learning environment is also very important to avoid disruptions in the process of teaching students, namely keeping learning interesting and providing the right stimulus. This can be facilitated by providing online learning materials both video, electronic books, which can be managed and accessed easily in a learning management system. Thus, online learning practices still motivate learners to study as they do when face-to-face learning (Agyeiwaah et al., 2021).

Self-Regulated Learning

Self-regulated learning is basically a personal sensitivity of learners to the extent and depth of knowledge possessed about a fact or what skills have been mastered or not both. In practice, the ability to gather information needed to understand something or overcome problems found when learning is an example of self-regulated learning (Zimmerman, 1990). SRL can include self-regulation processes as well as self-regulated learning strategies. The process of self-regulation refers to the confidence of the learner, while the SRL strategy is the strategy needed to achieve goals and maximize the process of self-regulation such as the strategy of digging for information and mastering skills. Nevertheless, the main characteristics of learners who have SRL are having motivation, metacognitive strategies and behavior adjustments to achieve academic goals (Zimmerman, 1989). The second characteristic of SRL is the ability of learners to assess themselves sustainably or the extent to which the strategies that have been carried out have effectively achieved academic goals, while the third characteristic is the ability to analyze why and how to use the strategy. Based on the results of the evaluation that has been done, a learner decides to choose a certain learning strategy to achieve the expected academic achievement (Zimmerman, 1990).

SRL is described with 4 phases and each phase is detailed into 4 regulatory scopes i.e. cognition, motivation, behavior and context. The first phase is planning and goal setting. This phase includes time planning, activating both initial knowledge and perception of the task. The second phase is monitoring of each process and requires metacognitive sensitivity to tasks and context. The third phase is

control which refers to the selection and persuasion of cognitive strategies, motivations, changing or establishing relevant behaviors and contexts. The fourth phase of reaction and reflection. In this phase, cognitive achievement is decided, responses to attitudes, relevant behaviors, and evaluation of tasks (Pintrich, 2004).

Determining a goal is the main step of self-regulation. An important part of setting goals is that students are able to interpret and appreciate these goals so that students are serious in the process of achieving them. Further, learners need to plan strategies that are expected to be effective to achieve these goals. The third step is that students implement selected strategies and evaluate the extent of the effectiveness of the strategy, the progress they have, and whether there is a gap between the goals set and reality. This shows that the determination of goals in the initial phase is very influential when monitoring in the performance phase as well as during evaluation and self-reflection (Wong et al., 2021).

Orientation to the goal is divided into 3, namely completing tasks, getting grades or awards and comparing work performances with other learners. Task completion correlates with intrinsic motivation, while orientation to get good grades and rankings is positively correlated with extrinsic motivation (Pintrich, 1999). Thus, how learners utilize information sources to develop knowledge or obtain legality or certificates of achievement can be known from the orientation of goals that have been made.

Online learning requires time management, metacognitive strategies, critical thinking and setting the efforts for the achievement of academic success (Broadbent & Poon, 2015). Nevertheless, some components in SRL differ between capable and less capable learners in academic achievement (Dent & Koenka, 2016). Learners whose achievements are good do not care about the initial achievements they have, in contrast to the underachieving ones. Therefore, in each task completion it is necessary to pay attention to all components of SRL in each phase (preparation phase, work performance and award). Motivation is indispensable for underachieving learners (Cho & Heron, 2015; Hirt et al., 2021).

In online learning, for example by utilizing MOOCs, the intervention in the SRL activity component is very influential on the completion or completion of students' learning. Intervention can be carried out during the preparation, implementation and reflection phases. The form of intervention can be the presentation of a video given before learning begins for example (Jansen et al., 2020). Providing a stimulus in the form of questions in the video encourages learners to be actively involved in SRL activities (van Alten et al., 2020) for example determining goals, making initial planning, monitoring and evaluating learning (Moos & Bonde, 2016).

Learners who have high SRL are learners who are able to control their learning environment and adjust to new learning situations (Muwonge et al., 2020). Success in learning requires metacognitive control. If the results show negative or no progress from previous learning or not in accordance with predetermined goals, then students need to make adjustments by choosing a new learning strategy. (Raković et al., 2022).

METHOD

This research was quantitative research with survey methods. The procedures carried out in this study were 1) the development of measurement instruments that is SRL skill questionnaire, 2) instrument validation, 3) instrument trials, 4) analysis of trial results using Confirmatory Factor Analysis for construct validity tests, 5) taking student SRL skill profile data using google form, and 6) data analysis.

There are 97 elementary school teacher education students who took the 4th semester where they experienced the transition from offline learning to online learning during the pandemic. Participants were taken with a non-probability sampling technique. Questionnaires are shared through google forms to obtain information about self-regulated learning skills.

The questionnaire consisted of statements that reveal demographic information and SRL skills. The scale used was 1-5 (1= strongly disagrees until 5= strongly agrees to consent and 1= never up to 5 = always for frequency). The SRL skills questionnaire in this study was developed based on an analysis of the results of previous research, namely that SRL includes regulatory processes and regulatory strategies. The process of self-regulation referred to the confidence of learners, while the regulatory strategy was the strategy needed to achieve goals and maximize the process of self-regulation such as information digging strategies. Determining a goal is the main step of self-regulation. An important part of setting goals was that learners were able to interpret and appreciate those goals. In addition, regulatory strategies are also shown by choosing certain learning strategies to achieve expected academic achievements (Pintrich, 2004; Wong et al., 2021; Zimmerman, 1989; Zimmerman, 1990). Thus, the questionnaire to measure SRL in this study included 3 indicators, namely **appreciation for tasks**, (3 statement items) **confidence in learning** (3 statement items) and **searching and studying information** (6 statement items) (Table 1). The questionnaire is validated to experts and tested in the field to obtain data used for construct validity tests using Confirmatory factor analysis.

Table 1. SRL indicators and the statements

Indicator	Symbol	Statement
Appreciation of the task	T1	Fulfillment of tasks in this course aims to get a good assessment at the end of the semester
	T2	I think the assignment in the Low-Grade Natural Science Learning course includes materials that are important for me to master

Indicator	Symbol	Statement
	T3	I find assignments in Low-Grade Natural Science Learning courses useful for improving my competence
Confidence in learning	S1	I am sure I can understand every content presented in the Low-Grade Natural Science Learning course
	S2	I can understand the most complex material presented in this Low-Grade Natural Science Learning course
	S3	I believe I can master the knowledge taught in this course
Searching and studying information	L1	As I study in this course, I set goals for myself to direct my activities in each period of study.
	L2	While studying, I make questions to help focus myself.
	L3	If the material feels difficult, I change the way to learn.
	L4	Before I learn a new topic, I read at a glance about the material.
	L5	I look at my notes during lectures to complete a given task.
	L6	I thought of the best way to learn before I learned.

Based on the analysis using Confirmatory Factor Analysis, judging from the loading factor values shown in Figure 1, all statement items meet the validity of the construct that has been built. There are three statements from the 12 statement items, namely one statement on the appreciation of the task indicator and two statements on the indicator finding and studying information whose loading factor value is close to 0.7 and the value is still tolerated (Ghozali & Fuad, 2014).

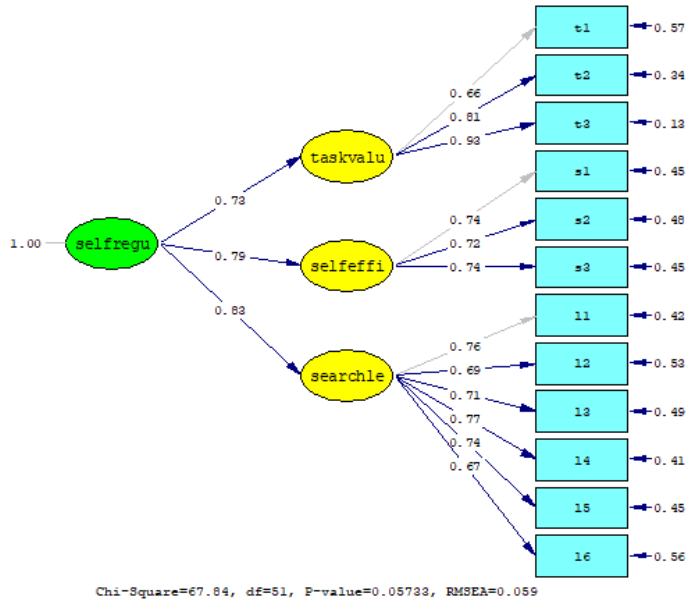

Figure1. The result of instrument construct validation based on standardized solutions

In figure 2, each statement has a significant correlation to the indicators indicated by t-value > 1.96. Goodness of fit criteria for RMSEA are 0.059 < 0.08 and insignificant p-value (0.057 > 0.05). This indicates that the model corresponds to empirical data (Hair et al., 2006).

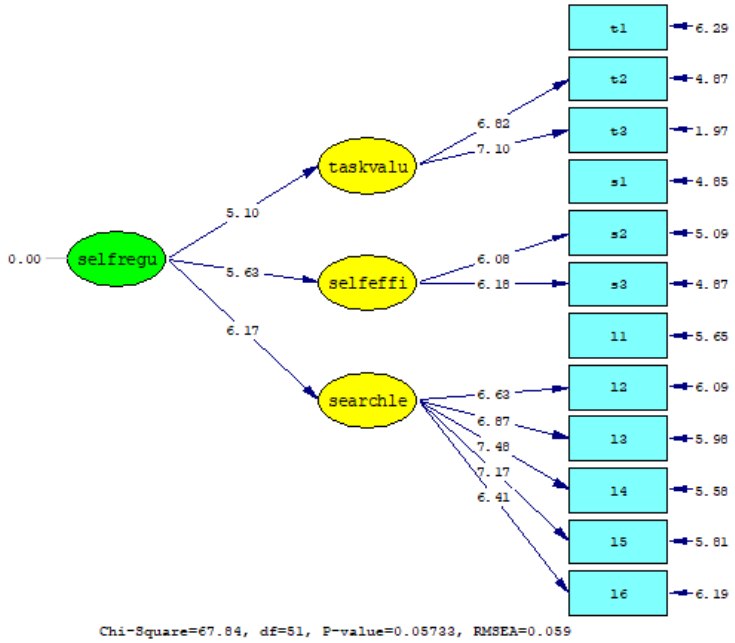

Figure 2. The result of instrument construct validation based on T-value

After the instrument was declared to have met the validity of the construct, the researchers estimated the reliability coefficient using Cronbach Alpha. The results of the analysis show Cronbach Alpha is 0.890. Kolmogorov-Smirnov tests showed data distributed normally with $p = 0.2$. To find out the skills of SRL students during online learning, data is presented descriptively. The second analysis used Pearson correlation to look at the relationships between indicators in the SRL.

Data analysis techniques used to find out the skills of elementary school teacher education students are statistical analysis descriptively. Furthermore, the data obtained through questionnaires was analyzed using Pearson Correlation to see the relationship between indicators in SRL skills, namely between appreciation for tasks with confidence in learning, appreciation of tasks by searching and studying information and confidence in learning and searching and studying information.

FINDINGS AND DISCUSSION

According to the gathering data from SRL Questionnaire through the google form, the following Table 2 is the result of descriptive data analysis of students' SRL skills during online learning in 4th semester.

Table 2. Descriptive statistics of SRL skills

Item	Strongy Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)	Mean	SD
T1	0	0	4.1	51.5	44.3	4.38	0.620
T2	0	0	2.1	36.1	61.8	4.61	0.511
T3	0	0	2.1	47.4	50.5	4.48	0.542
S1	0	3.1	29.9	50.5	16.6	3.80	0.745
S2	1	3.1	46.4	42.3	7.2	3.52	0.723
S3	0	0	19.6	57.7	22.7	4.01	0.637
	Never	Seldom	Sometimes	Often	Always	Mean	SD
L1	0	4.1	18.5	54.6	22.7	3.96	0.763
L2	3.1	19.6	35	33	9.3	4.25	0.622

L3	1	6.2	38.1	42.3	12.4	3.71	0.877
L4	1	7.2	32	41.2	18.5	3.64	0.949
L5	1	2.1	13.4	52.6	31	3.81	0.768
L6	2.1	6.2	23.7	43.3	24.7	3.80	0.964

The following Table 3 shows the correlation between indicators within SRL skills use Pearson Correlation.

Table 3. Correlation between indicators within SRL skills

	Appreciation of task	**Confidence in learning**	**Searching and studying information**
Appreciation of task	…	0.48**	0.563**
Confidence in learning	…	…	0.524**
Searching and studying information	…	…	…

***$p < 0.001$*

Referring to the results of the descriptive analysis on Table 2, appreciation of the task is not only from extrinsic motivation but also intrinsic motivation. There is 44.3% of students prioritize the acquisition of good grades (extrinsic motivation) to be used as a goal orientation in completing assignments and only a small percentage of students (4%) choose neutral. This means not only prioritizing good grades but also other reasons. This is supported by the tendency of students that studying materials in courses is important to develop self-competence (intrinsic motivation). As research has been done by Hirt et al. (2021) that prioritizing the extrinsic motivation tends to be characteristic in students with low academic ability and vice versa. It is also supported by research Lee et al. (2020) that mastery of knowledge and skill development becomes the main orientation by learners from the upper group and have good self-regulated learning. Nevertheless, this needs to be explored further to show whether respondents who do not prioritize grades are from groups of students with top academic achievement. Appreciating a task can be raised through learning that integrates real experience into a project so that students understand how the benefits and importance of the task in solving everyday problems (Muwonge et al., 2020).

In the indicator of confidence in learning, 50% of students believe they can understand every content presented and 58% believe they can master the knowledge taught in the course, but less confident in complex material (46%). Nearly half of all respondents positioned themselves on neutral choices in other words could assume that students are not confident in understanding the material, especially those that are complex. This shows that students do not yet have full confidence that they can master every content of the material presented. Most students are confident that they can master the knowledge taught. Meanwhile, confidence is needed by learners to direct them to perform their best during online learning in order to meet the good achievements. (Wong et al., 2021). Lecturers or teachers need to provide encouragement to motivate learners so that confidence while learning can grow for the process of self-regulation. One of them can be done by identifying the needs of learners in learning and making the necessary adjustments (Granberg et al., 2021). Referring to Bandura's theory, a person's beliefs, environmental conditions and behavior have an effect on achievement. Changes in the learning environment from previously offline to online are predicted to affect or change students' confidence in learning (Warshawski, 2022). Students who have a high SRL level will make adjustments to more complex learning materials, for example by breaking down the material into several parts that are more manageable and learned (Pintrich, 2004).

In the third indicator, searching and studying information related to learning strategies shows that only a small percentage of the number of respondents who do not pay much attention to the right learning strategies to achieve learning success. Learning strategy is one form of learner behavior. On average, there are 43 students who often pay attention to their learning strategies such as setting their learning goals, changing the way they learn if they have difficulties, making some questions, using notes to complete tasks, determining how to learn accordingly and digging for initial knowledge by reading the material before learning begins. Only about 22.6% of students always set learning goals for themselves. Setting learning goals is an important part of task analysis. The most striking result is in the use of strategies to make questions related to the material studied. In this second item, it is seen that 19% of students rarely make questions related to materials to help focus during study. Strategies to make questions can help focus on learning is an example of the process of self-control (Granberg et al., 2021) however there is only 9 students always use this strategy.

There are 42.3% of students who often change their way of learning when there are learning difficulties. Students who change the way they learn if they have learning difficulties mean that the student actively makes adjustments and realizes the strengths and weaknesses of his academic ability (van Alten et al., 2021). This shows that there is a concern for yourself. Self-care is a form of monitoring learning progress. This monitoring phase is very important as part of the self-observation process (Granberg et al., 2021). Monitoring is needed to determine whether the strategy used is appropriate to achieve the learning goals that have been determined at the beginning (Vrieling et al., 2017). Metacognitive strategies determine success during online learning (Broadbent & Poon, 2015).

Cognitive arrangements were also carried out by 41.2% of students by first reading the topic or material before being given in the course. The strategy helps activate the initial knowledge of the material that will later be studied together in the course (Pintrich, 2004).

Pearson correlation analysis is used to look at correlations between indicators in SRL skills as shown on the Table 3. The results of the analysis showed that appreciation for tasks and confidence in learning had positive and significant correlations (0.000 < 0.001). Because of the correlation number is positive, which is 0.480, it can be said that the correlation between the two is unidirectional but the correlation is not so strong. This means that if the reward for the task is very high, the confidence of students in learning is also high. The second correlation test between appreciation of the tasks and searching and studying information shows correlation numbers of 0.563 and $p = 0.000 < 0.001$. This means that there is a significant, positive and unidirectional correlation. If students view a task as valuable and important for the development of their competence, then students will make efforts and manage their learning strategies better to achieve their established learning goals (Artino & Jones, 2012).

The third correlation test is between confidence in learning and searching and studying information. The results showed a significant, positive and unidirectional correlation with the correlation numbers 0.524 and $p = 0.000 < 0.001$. This is in accordance with previous research that students who have high confidence in learning are also able to use a variety of learning strategies in accordance with existing conditions (Pintrich, 2004; Zimmerman, 2000). Self-efficacy is said to be a significant predictor of learning strategies in SRL. In online learning using MOOC, for example, there is a positive correlation between task value and the use of learning strategies as well as self-efficacy with the use of learning strategies by students (Lee et al., 2020). High self-efficacy in students will further encourage and influence student behavior to choose the right learning strategies used during online learning. As previous research explains that students will more carefully determine learning strategies that are in accordance with the conditions at hand if the learner has high confidence and highly appreciates the tasks given (Lee et al., 2020).

Based on the survey results, a small percentage of students never pay attention to their learning strategies (including making adjustments to certain conditions). Thus, online learning design must be able to facilitate and support students with diverse backgrounds and experiences to improve self-regulated learning. Providing guidance for example by using an electronic portfolio that contains directions to plan, control, and evaluate student performance. Online learning where physical tutoring is less interactive than face-to-face learning can be a challenge. Monitoring and evaluation of online learning is needed to meet the needs of learners (Bol & Garner, 2011).

CONCLUSION

Based on the results of surveys and analyses that have been conducted, more than half of students highly appreciate the tasks given during learning in addition to being extrinsically motivated but also intrinsically motivated. However, descriptive analysis results on the second indicator showed that almost half of students tended to lack confidence in the mastery of the material presented, especially complex material. In the third indicator, most students have managed their learning strategies such as strategies when searching and learning information starting from setting learning goals, utilizing notes to complete tasks, reading to activate initial knowledge about new topics to be learned and monitoring and learning control if they have learning difficulties to then replace learning strategies that are estimated to be more in accordance with the existing situation. Regarding the correlation between aspects in SRL skills, rewards to tasks are positively correlated with confidence, task rewards are positively correlated on the use or selection of learning strategies when seeking and studying information, and confidence is positively correlated with the use of learning strategies. These results is important for teachers, lecturers or policy maker to prepare each aspect of teaching and learning especially for online learning. Support system such as material which is provided by online have to easily access, interesting, interactive and completed with guidelines in order to trigger students' motivation and self-efficacy in learning. It is important to evaluate the students' SRL skills periodically so that we can improve our instructional properly. There needs to be periodic monitoring, evaluation and improvements in learning to improve student SRL in addition to improving student academic achievement (Granberg et al., 2021).

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