Exploring SRL Differences: Science vs. Social Science Students in Soe, NTT

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Abstract

This study examines the differences in Self-Regulated Learning (SRL) skills between 3rd-grade science and social studies students at SMA X Soe City, South Central Timor Regency. The total population for this study was 386 students, with a sample of 196 students from SMA X Kota Soe, South Central Timor Regency, determined using the Slovin formula. The sample was further divided into 94 science class students and 104 social studies class students. The Self-Regulated Learning questionnaire comprises 39 question items that have undergone validity testing and have been deemed valid. The questionnaire has a high reliability coefficient of 0.955. Science students exhibit a mean value of 116.4255 for Self-Regulated Learning skills, which is higher than the mean value of social studies students, which is only 107.9510. The data analysis technique employed was Independent Sample T-Test. The results per aspect of Self-Regulated Learning (Motivation, Metacognition, Behavior) suggest that science students outperformed social studies students, indicating a difference in Self-Regulated Learning between the two classes. It can be concluded that the level of Self-Regulated Learning is higher in the science class than in the social studies class.

Keywords: Senior High School; Self Regulated Learning; Post-Pandemic Era

Introduction

Online learning has both positive and negative effects on education. While it provides convenience and flexibility, it can also have adverse effects on students' ability to absorb learning materials. It is important to approach any upcoming changes in the dynamic field of education with maturity and careful consideration. As Dewi's (2020) research suggests, students may need to adapt to online learning, which could indirectly impact their ability to absorb learning materials. The challenge of self-adjustment in online learning is a relatively new phenomenon, particularly in effectively conveying information to students due to suboptimal delivery (Elfahmi, 2020; Djaswadi, 2021). It is worth noting that East Nusa Tenggara Province, located in eastern Indonesia, has a total of 22 districts/cities with both private and public schools ranging from elementary to tertiary education.

Kennedy et al. (2019) identified several challenges related to education in NTT. These include: (a) limited access to education due to low quality of education, inadequate educational facilities and infrastructure, poor quality of teaching staff, ineffective education system management, and limited

education funding; (b) inadequate facilities and infrastructure to support education, such as libraries, multi-purpose rooms, laboratories, and sports facilities; (c) less qualified teaching staff; and (d) students with low abilities and skills due to gaps in the abilities and skills of teaching staff. These issues are associated with the transition from offline to online learning due to Covid-19. As Prawanti & Sumarni's (2020) research has shown, online learning may only provide limited information to students in the form of videos and textbook instructions. According to Denni (2020), challenges have been observed in online learning during the pandemic, leading to unengaging lessons and difficulties in understanding the subject matter. One contributing factor to this issue is the absence of creativity and innovation among educators. It is worth noting that subjective evaluations have been omitted and technical term abbreviations have been clarified. Dewi (2020) found that some senior teachers need training before implementing online learning. Looking at these findings, online learning without preparation and training can make educators and learners experience difficulties in implementation and adaptation when dealing with online learning that requires mastery of technology.

According to Argaheni (2020), inadequate preparation by educators for online learning can impede students' ability to achieve learning objectives and comprehend the material, ultimately affecting their motivation negatively. Additionally, Muhammad (2017) notes that a person's learning motivation is influenced by both internal and external factors. Motivation is influenced by external factors, which can be affected by the social and nonsocial environment (Syah & Wardan, 2003). However, it is important to note that an unfavorable social environment, such as unprepared educators during online learning, may lead to a decrease in students' motivation to learn. In such cases, the absence of external factors that provide motivation can result in students having to rely on self-regulation. According to Bandura (1997), the formation of self-regulation is triggered by external factors. Dewi et al. (2021) elaborate that external factors have an impact on students' self-regulation skills, which in turn leads to independent preparation and organization of learning patterns. This level of learning independence is typically observed in high school or equivalent levels.

In Indonesia, high school students are divided into different majors under the 2013 curriculum. Science majors focus on natural sciences such as Chemistry, Physics, Mathematics, and Biology, while social studies majors focus on social sciences such as History, Economics, Geography, and Sociology. The characteristics of learners often encompass a variety of factors, including but not limited to ethnicity, culture, social status, interests, cognitive development, initial abilities, learning styles, motivation, emotional development, social development, moral and spiritual development, and motor development. With regards to one of the distinguishing features of high school students, specifically the difference between science and social studies majors (Husna, 2014), there may be variations in student attitudes and learning preparation during the learning process. It has been observed that students in science classes tend to have more preparation during the learning process compared to those in social studies classes. According to Hidayah et al. (2022), it was found that 80% of students expressed interest in learning English, regardless of whether they were in science or social studies classes. However, the study also revealed that there was a difference in motivation levels between the two groups, with science students showing higher levels of motivation compared to social studies students. During learning discussions, it has been observed that science class students tend to be more active in asking and answering questions, while social studies students tend to be more passive and remain silent.

In order to optimize the learning experience, it is important to consider several key components, including educators, students, facilities and infrastructure, educational environment, and curriculum as teaching material. In the context of learning, it is important for learners to possess self-regulation skills. These skills include the ability to expand their knowledge, maintain motivation, recognize their emotional state, employ strategies to manage their emotions, periodically monitor their progress, and evaluate obstacles that may arise and make necessary adaptations. By practicing self-regulation, students can apply Self-Regulated Learning (SRL), which emphasizes learning independence and can help motivate them to

improve the quality of their learning and achieve their goals (Gusty et al., 2020). SRL involves the ability to bring up and monitor individual thoughts, feelings, and behaviors in pursuit of a goal (Santrock, 2007).

High SRL can assist students in gaining a deeper understanding of the subject matter, which may result in improved learning outcomes. As per Zimmerman et al. (Santrock, 2007), SRL encompasses metacognition, motivation, and behavior. Metacognition pertains to an individual's capacity to plan, organize, regulate, instruct, monitor, and evaluate learning activities. Motivation is associated with the fundamental need for control and is connected to an individual's sense of competence. Behavior refers to an individual's capacity to regulate themselves, choose, and utilize their surroundings to establish an environment that facilitates learning activities.

Self-regulated learning or learning independence is the ability to self-regulate or self-organize in order to evaluate all learning activities. There are three aspects that support SRL skills, namely metacognition, motivation, and active learning behaviors. In the metacognition aspect, students have the ability to organize learning activities. Then, in the motivation aspect, students have a natural drive that comes from within the individual (intrinsic) and there is no coercion or encouragement from other parties in the learning process. This motivation is self-generated and therefore varies from individual to individual. Furthermore, the aspect of active learning behavior, students have a goal so that they can understand and comprehend what they learn both before and after the learning process is carried out (Wahyu & Laksmiwati, n.d.). Based on this explanation, researchers want to reveal any differences in students' independence on self-regulated learning skills between science students and social studies students caused by changes in the post-pandemic learning model.

Research Method

This research used a comparative design. This research was conducted by comparing the ability of self-regulated learning between students of class XII (grade 3 of high school) in science and social studies at SMA X, Soe City, South Central Timor Regency. The sample population in this study was 386 students, then the Slovin formula was used to obtain a sample of 196 students. The sample consists of 94 students of social studies class XII and 104 students of social studies class XII. Data collection was carried out with a Self-Regulated Learning Questionnaire through Google Form which was scored based on a Likert scale (score 1 to score 5), there were 39 question items which were tested for validity and reliability with a score of 0.955 which was categorized as high. The assessment of self-regulated learning includes the assessment of motivational aspects such as expectations, values, and affect (Pintrich & De Groot, 1990), behavioral aspects such as selection, organization, and control (Fasikhah & Fatimah, 2013; Savira & Suharsono, 2013), and metacognitive aspects such as planning, monitoring, and self-evaluation (Panggayuh, 2017; Kristiyani, 2016). Data analysis was conducted using SPSS 26 and the independent samples test formula.

Results

The results of an independent sample test showed a comparison of self-regulated learning skills between students of science class and social studies class. Known in Table 2, the acquisition of F results of 1.370 with a significance value of 0.243, which means greater than 0.05, so the variants are grouped as homogeneous data. Then, the results of data analysis were obtained with the t coefficient of 3.306 with a probability of 0.001, which compared to 0.05, the probability value is smaller. Thus, it is proved that there is a difference between the self-regulated learning skills of students of class XII IPS and students of class XII IPA.

Table 1

Group Statistics

	kelas	N	Mean	Std. Deviation	Std. Error Mean
hasil	IPA	94	116.4255	17.51097	1.80612
	IPS	102	107.9510	18.30077	1.81205

Table 2

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
hasil	Equal variances assumed	1.370	.243	3.306	194	.001	8.47455	2.56306	3.41950	13.52960
	Equal variances not assumed			3.312	193.720	.001	8.47455	2.55843	3.42859	13.52051

In Table 1, the mean SRL of science students is 116.4255, which tends to be higher than the SRL of social studies students, which is only 107.9510. This also shows that there are differences in the students' self-regulated learning skills between the two classes.

Table 3

XII-IPA	**Result**		
	Motivation	*Metacognition*	*Behaviour*
Mean	35,8511	43,4894	38,0851
Std. Deviation	6,53190	7,15684	6,22630

In Table 3 and Table 4, the mean values of each aspect of SRL, namely motivation, metacognition, and behavior in science class are (35.8511), (43.4894) and (38.0851), respectively, which are higher than the mean values of each aspect in social studies class, namely (33.8529), (41.4902), and (34.6078).

Table 4

XII-IPS	**Result**		
	Motivation	*Metacognition*	*Behaviour*
Mean	33,8529	41,4902	34,6078
Std. Deviation	6,62040	7,23406	6,88111

Thus, the overall SRL scores and the SRL per aspect (motivation, metacognition, and behavior) are higher in the science class than in the social studies class.

Discussion

Online learning requires self-regulated learning skills or independent learning, which are essential in determining and managing individual learning strategies. The results of the acquisition of SRL skills between XII IPA and IPS students show that there are differences in SRL between the two sample groups. It is worth noting that science students tend to have higher SRL skills than social studies students. According to Sari et al. (2022), science students exhibit higher levels of self-regulated learning (SRL) skills, which are influenced by motivation. Meanwhile, Mahayasih (2020) noted differences in the behavior of science and social studies teachers at SMAN 3 Kupang. Specifically, in science classes, teachers tended to assign more work and provide greater supervision. In IPS, teachers may not always be present in the classroom. As a result, some students may feel more at ease and opt to spend time in the cafeteria, even during class time. Furthermore, social studies students may be compared to science students, which could potentially affect student motivation.

In Indonesia, science majors have significantly more study hours compared to social science majors. Therefore, science majors require a high level of learning independence to develop better self-regulated learning during the learning process. The motivational aspect of the science class showed higher SRL achievement results than the social studies class. Science classes tend to perform better in more demanding lessons. (1) the hope component, which refers to a person's confidence in their ability to perform a task; (2) the value component, which refers to a person's awareness of the importance of a task, making it interesting and important to do; and (3) the affective component, which refers to a person's emotional response to a given task. Pintrich and De Groot's (1990) theory describes the motivational aspect of self-regulated learning (SRL) as having three components: When these three components are met, the motivational aspect of SRL tends to be higher, which can positively affect students' performance (Kusumawati, 2018). When these three components are met, the motivational aspect of SRL tends to be higher, which can positively affect students' performance (Kusumawati, 2018). When these three components are met, the motivational aspect of SRL tends to be higher, which can positively affect students' performance (Kusumawati, 2018).

The results of the SRL analysis for metacognition in the science class were higher than those in the social studies class. Metacognition refers to a person's awareness of their cognitive abilities, including knowledge, skills, and regulation, to achieve goals (Chairani, 2016). Good metacognitive skills enable individuals to take responsibility for their learning process and develop self-regulation (Fahreza et al., 2019). According to Kristiyani (2020), metacognition refers to an individual's ability to plan, set goals, organize, self-observe, and self-evaluate, which can aid in determining how to learn. Students who comprehend their cognitive processes through planning, monitoring, and evaluating activities tend to develop self-regulated learning (SRL) skills more easily (Panggayuh, 2017). However, this focus on grades may hinder the development of metacognitive aspects of self-regulated learning.

In social studies classes, it has been observed that students may sometimes become noisy and inattentive during learning activities, which may lead to a lack of concentration while studying (Mahayasi, et al., 2020). As a result, it has been found that students' learning management behaviors in social studies classes are lower compared to those in science classes. These findings have been confirmed through the behavioral aspect of the study. According to Azizah et al. (2021), the behavioral component of self-regulated learning involves an individual's capacity to regulate or control their learning needs, including preparing tasks, developing strategies, evaluating, and improving. Fasikhah and Fatimah (2013) also observed that seeking assistance is one of the behaviors exhibited during self-regulated learning, along with organizing one's schedule and study environment. Behaviors that can be indirectly regulated may promote independence in individuals, including independence in learning.

Learning can be effective when the learning environment is made supportive. This includes the availability of physical learning facilities, a comfortable place to study, a calm atmosphere, and

harmonious relationships with the social environment. These conditions can encourage students to learn and improve student learning outcomes. However, it has been observed that a learning environment that lacks support may have an adverse effect on students' enthusiasm for learning, which in turn may lead to decreased learning outcomes (Halim et al., 2020). According to Ariyanti (2019), students' learning independence can be enhanced through various means, such as informing them about new learning strategies and encouraging independent idea incorporation, utilizing goal-setting as a learning strategy, demonstrating strategies and self-talk, providing work process feedback, and asking students to monitor their learning strategies and record their effects. Therefore, it can be said that science majors tend to exhibit better self-regulated learning (SRL) during the learning process. As per Damaianti's research (2021), higher SRL has been associated with better reading ability, which suggests that high SRL can motivate students to seek out the information they need to learn.

Conclusion

Observations were made regarding differences in self-regulated learning between science and social studies students at SMA X in Soe City, South Central Timor district, Indonesia. It was found that science students had a higher mean score for Self-Regulated Learning skills (116.4255) compared to social studies students (107.9510). Furthermore, science students scored higher in motivation (35.8511), metacognition (43.4894), and behavior (38.0851) than social studies students. Hence, based on the available data, it can be inferred that the level of student regulation of learning (SRL) in the science class at SMA X is comparatively higher than that in the social studies class.

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