STUDENTS' METACOGNITIVE AWARENESS INVENTORY (MAI) OF ENGLISH LANGUAGE EDUCATION STUDY PROGRAM

METACOGNITIVE AWARENESS INVENTORY (MAI) MAHASISWA PROGRAM STUDI PENDIDIKAN BAHASA INGGRIS

[1,2]*Aulia Putri, [1]Ribut Wahyu Eriyanti, [1]Ainur Rofieq, [1]Atok Miftachul Hudha
[1]Postgraduate Program, Universitas Muhammadiyah Malang, Malang, Indonesia
[2]English Language Education Study Program, Universitas Riau Kepulauan, Batam, Indonesia

*Corresponding author: aulia@fkip.unrika.ac.id

ABSTRACT

This study aimed to identify the Metacognitive Awareness Inventory (MAI) of students in the English Education Study Program at the Faculty of Teacher Training and Education, *Universitas Riau Kepulauan.* The MAI consists of a self-administered questionnaire, which was administered to English Language Education students at the Faculty of Teaching and Education. This study also aimed to investigate the difference in the Metacognition Awareness levels between freshman and senior students. This study was qualitative research with 116 respondents. This study used cluster sampling which is part of probability sampling. The data were collected by using the MAI questionnaire. After that, the data were analyzed by counting the total score and percentage for each questionnaire sentence. The calculated data were explained part by part to obtain an ideal conclusion. The results exposed that the participants got the highest result in the Regulation of Cognition. For comparing Freshman and Senior Students, the Senior Students got the highest results for both Knowledge about Cognition and Regulation of Cognition.
Keywords: freshman students, metacognitive awareness inventory, senior students

ABSTRAK

Penelitian ini bertujuan untuk mengidentifikasi Inventori Kesadaran Metakognitif (MAI) dari mahasiswa Program Studi Pendidikan Bahasa Inggris di Fakultas Keguruan dan Ilmu Pendidikan, Universitas Riau Kepulauan. MAI terdiri dari kuesioner mandiri, yang diberikan kepada mahasiswa Pendidikan Bahasa Inggris di Fakultas Keguruan dan Ilmu Pendidikan. Penelitian ini juga bertujuan untuk menyelidiki perbedaan Tingkat Kesadaran Metakognitif antara mahasiswa semester pertama dan mahasiswa senior. Penelitan ini adalah penelitian kualitatif dengan 116 responden. Penelitian ini menggunakan cluster sampling *yang merupakan bagian dari probabilitas* sampling*. Data dikumpulkan dengan menggunakan kuesioner MAI. Setelah itu, data dianalisis dengan menghitung skor total dan persentase untuk setiap kalimat kuesioner. Data yang dihitung dijelaskan secara bertahap untuk mendapatkan kesimpulan yang ideal. Hasilnya menunjukkan bahwa partisipan mendapatkan hasil tertinggi dalam regulasi kognisi. Untuk perbandingan antara mahasiswa semester pertama dan mahasiswa senior, mahasiswa senior mendapatkan hasil tertinggi baik untuk pengetahuan tentang kognisi maupun regulasi kognisi.*
Kata kunci: *mahasiswa baru, mahasiswa senior, inventori kesadaran metakognitif*

INTRODUCTION

Metacognitive awareness, an essential factor within educational environments, plays a central role in fostering problem-solving abilities. Students can effectively navigate through complex information and achieve better understanding and retention by being aware of their strengths in learning and metacognitive awareness (Kaivanpanah et al., 2019). Through metacognition, individuals attain mastery over their learning processes, thereby cultivating a sense of autonomy and control over their academic journey. Its significance goes beyond mere comprehension, actively contributing to enhanced academic performance and accomplishment. Ultimately, developing metacognitive awareness establishes a solid basis for lifelong learning and intellectual advancement (Jariyah & Ummah, 2022).

Metacognitive awareness, an invaluable skill, empowers learners by enabling them to intricately plan effective strategies tailored to their objectives. This awareness also facilitates the critical evaluation of outcomes, allowing individuals to discern the effectiveness of their approaches. By drawing on prior knowledge and experiences, learners adept in metacognition can seamlessly adjust and refine their methods, fostering a pathway to achieving personal goals with greater success. Ultimately, this heightened self-awareness enhances learning experiences, empowering individuals to navigate challenges with adaptability and efficacy. The mastery of metacognitive skills stands as a pivotal factor in shaping successful attainment of one's aspirations and ambitions (Abdelrahman, 2020).

English Language Education encompasses a wide range of focal points. It explores the complexities of international communication, catering to various domains such as general, academic, business, and professional contexts. This multifaceted approach highlights the significance of linguistic adaptability in navigating a globalized society. Comprehending English for general purposes involves fluency in everyday conversations, enabling individuals to engage comfortably across diverse social settings. In academic spheres, proficiency aids in accessing a vast array of information, facilitating research, and promoting scholarly discussions. Furthermore, in business and professional settings, mastering English is crucial for effective collaboration, negotiations, and conveying specialized information across borders. Overall, the scope of English Language Education extends well beyond mere linguistic competence, integrating cultural understanding and pragmatic skills that are essential for success in an interconnected world (Leung, 2017).

Metacognitive awareness holds significant importance within the realms of educational psychology and second language acquisition, exerting a pivotal influence on both academic achievement and language learning outcomes. Metacognitive awareness refers to the ability to think about one's own thinking or knowledge and how it was acquired. It involves introspection and plays a crucial role in deep learning and critical thinking (Silistraru & Vetrila, 2023). Metacognition is considered one of the most important components of the human cognitive system (Ivanchei & Servetnik, 2023). It is a key factor that allows individuals to exercise control over their thinking (Doyle, 2013). Metacognitive awareness is necessary for effective learning and is a competence that teachers should develop in themselves and their students (Mendoza et al., 2023). Originating in the early 1970s, the concept of metacognition has undergone extensive scrutiny and definition by scholars, among whom John Flavell stands prominently. This construct not only involves the knowledge of cognitive processes but also extends to the strategic application of this knowledge in learning and problem-solving scenarios. As an integral part of cognitive development, cultivating metacognitive skills contributes significantly to effective learning strategies and adaptive problem-solving methodologies, fostering a deeper grasp of complex concepts (Moshman, 2018). Therefore, it can be

inferred that having metacognitive awareness, which includes the capability to reflect on one's own thinking and how it is gained, is essential in educational psychology and learning a second language for improving academic success, language learning results, and efficient learning methods.

The Metacognitive Awareness Inventory (MAI) serves as a crucial tool in educational research, targeting the assessment of students' metacognitive prowess. In addition to this, the MAI has been employed to assess students' metacognitive abilities in various areas such as declarative, procedural, and conditional knowledge (Hassan et al., 2023). Its primary objective lies in quantifying and evaluating the diverse spectrum of metacognitive abilities wielded by students. This inventory facilitates a comprehensive analysis of how students harness these metacognitive components, shedding light on the variations in their application. Furthermore, it has been used to gauge their capacity to plan, monitor, and evaluate their cognitive processes (Frolova, 2022). Moreover, The MAI has been observed to have connections with academic success, cognitive style engagement, and the development of maladaptive behaviors (Tuononen et al., 2023). Through meticulous examination, the MAI strives to pinpoint the distinct differences in metacognitive strategies employed by individuals in tackling various cognitive tasks and challenges. Its overarching goal is to elucidate the efficacy and nuances of metacognitive approaches utilized by students across different educational contexts. By elucidating these differences, the research surrounding the MAI endeavors to offer valuable insights into optimizing teaching methodologies and fostering enhanced metacognitive development among learners. Ultimately, this research paves the way for a deeper understanding of metacognition's role in learning and education (Rinaldi & Rahmatillah, 2022).

Prior studies have examined metacognitive awareness in language education. Syahidah et al. (2023) conducted a study on aviation cadets and found that metacognitive reading strategies were important for reading performance in the English language context. Kessler (2021) investigated the development of metacognitive genre awareness in L2 English students learning non-academic genres in a professional context. Üstünbaş&Alagözlü (2021) compared the metacognitive awareness of pre-service and in-service English teachers and found that in-service teachers got higher levels of metacognitive awareness. Bessy & Knouse (2020) implemented language learning modules in L2 French and Spanish classes and found that these interventions enhanced students' metacognitive and metalinguistic awareness. In'nami & Koizumi (2022) examined the relationship between L2 listening comprehension and metacognitive awareness, focusing on the moderating effects of listening tests and learner samples. From the previous research, the researcher found the gap for this research which was to identify the difference in metacognitive awareness levels between freshman and senior students.

In line with what have been explain before, understanding one's thought processes significantly enhances learning efficiency and academic achievement through tailored approaches to learning. This self-awareness allows for the identification and utilization of personalized study techniques, aligning with individual cognitive strengths. Moreover, it fosters effective problem-solving by adapting strategies to one's unique thinking style, promoting versatility in tackling academic challenges. Additionally, it aids in time management and self-regulation, facilitating better focus and motivation while managing stress effectively. Improved communication skills stem from the clarity gained in articulating thoughts, promoting collaboration and idea exchange. Furthermore, this awareness supports long-term retention strategies, fostering a deeper understanding of subjects. Ultimately, it nurtures critical thinking abilities by refining analytical and creative skills, culminating in sustained academic success.

There are two objectives of the study, the first is to identify students' metacognitive awareness and the second one is to investigate the difference of its levels between Freshman and Senior Students in the English Language Education Study Program at Faculty of Teacher Training, *Universitas Riau Kepulauan.* The focus is on assessing whether there is a significant difference in MAI scores between these two student levels. This study is expected to provide a deeper understanding of the development of metacognitive awareness during their academic journey. The different educational experiences students have may impact their awareness of how they think and learn. This raises questions about potential differences in their understanding.

MATERIAL AND METHODS

This research was qualitative research. It involved giving a questionnaire to the English Language Education students. The questionnaire used in the study was derived from Schraw and Dennison's Metacognitive Awareness Inventory (MAI) in 1994. It was deemed validated upon adoption and was administered to collect data on students' cognitive awareness, with a focus on two dimensions: knowledge and regulation (Schraw & Dennison, 1994). Conceptual knowledge relies on the foundational elements of declarative, procedural, and conditional knowledge. While, regulation pertains to students' understanding of how to apply strategies and their capability to assess the efficiency of these strategies.

The samples in this study were 116 respondents from 146 students as the population. To answer the first objective of the study, the researcher took all samples. Then, to investigate the second objective of the study, the researcher compared only Freshman Students (the 1st year students) which consist of 34 students and Senior students (the 4th year students) which consist of 17 students. This study used cluster sampling since only year 1 to 4 that were taken as the sample. The questionnaire includes 52 statements that require a true or false response. Respondents will provide a response of "true" if they perceive the statement to reflect their personal experience, and conversely, they will provide a response of "false" if they perceive the statement to not align with their personal experience. In the case of a true response, a score of "I" will be assigned, whereas a false response will be assigned a score of "0". The data is analyzed in the form of statistics presented and explained in tables and bar diagrams to find differences between groups. First, the researcher found the average per aspect from the two dimensions: **knowledge** and **regulation**. Then, the average of these two dimensions were calculated. Furthermore, the computed data were presented in the form of percentages according to different aspects in order to derive a comprehensive and representative conclusion. The percentage is obtained from the number of students who answered "True" for each statement in the questionnaire divided by the total number of students (116 students) who filled out the questionnaire. For Knowledge about Cognition, the aspects are Declarative Knowledge, Procedural Knowledge, and Conditional Knowledge, While for Regulation of Cognition, the aspects consist of Planning, Comprehension Monitoring, Information Management Strategies, Debugging Strategies, and Evaluation.

RESULT AND DISCUSSION
RESULTS

To answer the first objective of the study, below is given the results of Knowledge about Cognition and Regulation of Cognition. When comparing the two, a consistent pattern was observed where Regulation of Cognition consistently outperforms Knowledge about Cognition. The variation is evident in the mean percentages: Regulation of Cognition had an average of 87,5% (101 out of 116 students), exceeding Knowledge about Cognition, which had an average of 82,5% (96 out of 116 students). The consistent prevalence of Regulation of Cognition indicated that those surveyed have a better understanding or implementation of it. The results highlight the importance of managing cognitive functions, not just gaining knowledge, in this assessment framework. This means, it is needed to focus on techniques and strategies to improve thinking skills in order to do better.
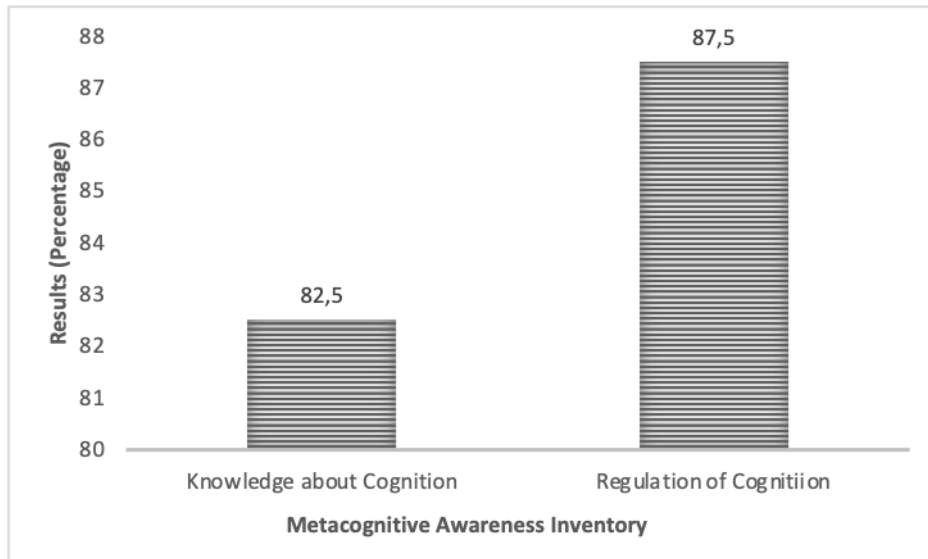
Figure 1. The Average of Metacognitive Awareness Inventory
(Knowledge about Cognition and Regulation of Cognition

Knowledge about Cognition, Procedural Knowledge had the highest result (86,9%; 100,8 out of 116 students). The lowest one was on Declarative Knowledge (80,7%; 93,6 out of 116 students). While in the middle was Procedural Knowledge with 86,6% (100,5 out of 116 students) as the result.
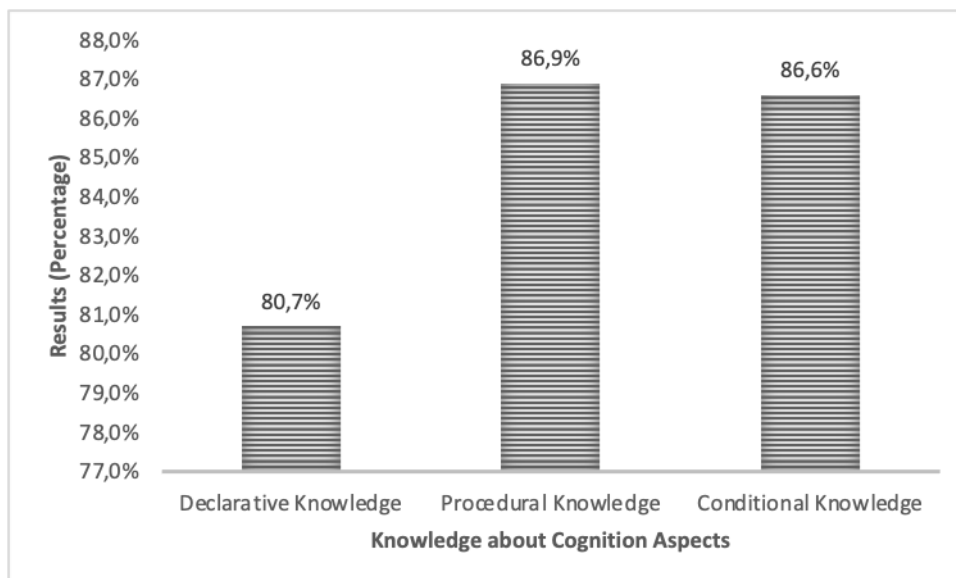
Figure 2. The Average of Knowledge about Cognition Aspects
(Declarative Knowledge, Procedural Knowledge, and Conditional Knowledge)

In Regulation of Cognition, the Comprehension Monitoring placed the most favourable score (90,9 %; 105,4 out of 116 students). The least one was Information Management Strategy (81 %; 94 students). The top to down of the results can be seen as: (1) Comprehension Monitoring, (2) Planning, (3) Debugging Strategies, (4) Evaluation, (5) Information Management Strategies.

Figure 3. The Average of Regulation of Cognition Aspects
(Planning, Comprehension Monitoring, Information Management Strategies,
Debugging Strategies, and Evaluation)
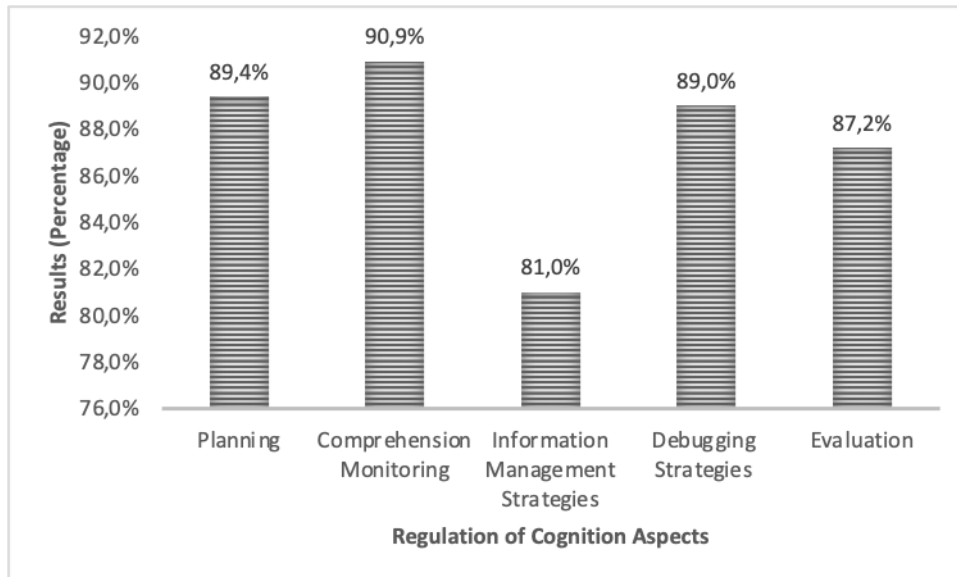
Metacognitive Awareness Inventory on Knowledge about Cognition

There are three parts in Knowledge about Cognition, namely: Declarative Knowledge, Procedural Knowledge, and Conditional Knowledge. The following provides a detailed explanation for each statement.

Table 1. Answers to Declarative Knowledge

Item	Statement	Total Respondents (out of 116)	Percentage (%)
5	I understand my intellectual strengths and weaknesses,	103	88,8
10	I know what kind of information is most important to learn.	105	90,5
12	I am good at organizing information.	81	69,8
16	I know what the teacher expects me to learn.	98	84,5
17	I am good at remembering information.	67	57,8
20	I have control over how well I learn.	96	82,8
32	I am a good judge of how well I understand something.	89	76,7
46	I learn more when I am interested in the topic.	110	94,8
	Average	94	80,7

Table 1 shows that most of the students learned more when they were interested in the topic (Statement 46 = 94,8 %; 110 out of 116 students). While only 57,8 % of them (67 out of 116 students) that were good at remembering information (Statement No. 17), which also means that 42,2 % of them (49 out of 116 students) were not good at remembering information. For the average of Declarative Knowledge, it got 80,7 % (94 out of 116 students).

Table 2. Answers to Procedural Knowledge

Item	Statement	Total Respondents (out of 116)	Percentage (%)
3	I try to use strategies that have worked in the past.	109	94
14	I have a specific purpose for each strategy I use.	101	87,1
27	I am aware of what strategies I use when I study.	100	86,2
33	I find myself using helpful learning strategies automatically.	93	80,2
	Average	101	86,9

For Procedural Knowledge, it can be seen from Table 2 that the most respond was given to statement No. 3 saying that the students tried to use strategies that have worked in the past (94 % = 109 out of 116 students). So, only 6 % (17 out of 116 students) that did not use strategies that they have tried working in the past. On the other hand, the least respond was about the students who found themselves using helpful learning strategies automatically (Statement No. 33 = 80,2 %; 100 out of 116 students). The average for Procedural Knowledge was 86,9 % (101 out of 116 students). It can be said, the students had more knowledge in Procedural compare to Declarative Knowledge.

Table 3. Answers to Conditional Knowledge

Item	Statement	Total Respondents (out of 116)	Percentage (%)
15	I learn best when I know something about the topic.	104	89,7
18	I use different learning strategies depending on the situation.	104	89,7
26	I can motivate myself to learn when I need to.	105	90,5
29	I use my intellectual strengths to compensate for my weaknesses.	102	87,9
35	I know when each strategy I use will be most effective.	87	75
	Average	100	86,6

From Table 3 about Conditional Knowledge, it can be said that the students could motivate themselves to learn when they needed to (Statement No. 26 = 90,5%; 105 out of 116 students). As a conclusion, only 9,5 % of the students (11 out of 116 students) that could not motivate themselves. The least score (75 %; 87 out of 116 students) is shown from the statement that they knew when each strategy they used will be most effective (Statement No 35). For the average, Conditional Knowledge got 86,6 % (100,4 out of 116 students) which took place as the second highest result in Knowledge about Cognition.

Metacognitive Awareness Inventory on Regulation of Cognition

There are five parts in Regulation of Cognition, namely: Planning, Comprehension Monitoring, Information Management Strategies, Debugging Strategies, and Evaluation. Here is a comprehensive explanation for each statement that has been listed.

Table 4. Answers to Planning

Item	Statement	Total Respondents (out of 116)	Percentage (%)
4	I pace myself while learning in order to have enough time.	97	83,6
6	I think about what I really need to learn before I begin a task.	111	95,7
8	I set specific goals before I begin a task.	104	89,7
22	I ask myself questions about the material before I begin.	92	79,3
23	I think of several ways to solve a problem and choose the best one.	108	93,1
42	I read instructions carefully before I begin a task.	112	96,6
45	I organize my time to best accomplish my goals.	102	87,9
	Average	104	89,4

Table 4 explains about Regulation of Cognition for Planning. It is seen that most of the students read instructions carefully before they began a task (Statement No. 42 = 96,6 %; 112 out of 116 students). The second one that was also chosen by 95,7 % of the students (111 out of 116 students) was that they thought about what they really needed before beginning a task (Statement No. 6). The least answer was that students asked themselves questions about the material before they began (Statement No. 22 = 79,3 %; 92 out of 116 students). In conclusion, the average for Planning was 89,4 % (104 out of 116 students).

Table 5. Answers to Comprehension Monitoring

Item	Statement	Total Respondents (out of 116)	Percentage (%)
1	I ask myself periodically if I am meeting my goals.	112	96,6
2	I consider several alternatives to a problem before I answer.	110	94,8
11	I ask myself if I have considered all options when solving a problem.	107	92,2
21	I periodically review to help me understand important relationships.	101	87,1
28	I find myself analyzing the usefulness of strategies while I study.	97	83,6
34	I find myself pausing regularly to check my comprehension.	103	88,8
49	I ask myself questions about how well I am doing while learning something new.	108	93,1
	Average	105	90,9

Table 5 is about Regulation of Cognition for Comprehension Monitoring. It is seen that most of the students answered that they asked themselves periodically if they were meeting their goals (Statement No. 1 = 96,6 %; 112 out of 116 students). This also means that only 3,4 % of them (4 out of 116 students) that did not do this. The lowest score (but still a big number) was given to the statement No. 28 which says that the students found themselves analyzing the usefulness of strategies while they studied. The average for Comprehension Monitoring was 90,9 % (105 out of 116 students), this means that almost all of them were already capable in this part.

Table 6. Information Management Strategies

Item	Statement	Total Respondents (out of 116)	Percentage (%)
9	I slow down when I encounter important information.	84	72,4
13	I consciously focus my attention on important information.	103	88,8
30	I focus on the meaning and significance of new information.	106	91,4
31	I create my own examples to make information more meaningful.	105	90,5
37	I draw pictures or diagrams to help me understand while learning.	61	52,6
39	I try to translate new information into my own words.	105	90,5
41	I use the organizational structure of the text to help me learn.	92	79,3
43	I ask myself if what I'm reading is related to what I already know.	106	91,4
47	I try to break studying down into smaller steps.	93	80,2
48	I focus on overall meaning rather than specifics.	85	73,3
	Average	94	81

From Table 6, it can be seen that most of the students answered that they focused on the meaning and significance of new information (Statement No. 30) and they also asked themselves if what they were reading was related to what they already knew (Statement No. 43). Both answers got the same score (91,4 %; 106 out of 116 students). The least statement answered by the students was that they drew pictures or diagrams to help them understood while learning (Statement No. 37 = 52,6 %; 61 out of 116 students). The average for this part was 81 % (94 out of 116 students).

Table 7. Answers to Debugging Strategies

Item	Statement	Total Respondents (out of 116)	Percentage (%)
25	I ask others for help when I don't understand something	110	94,8
40	I change strategies when I fail to understand.	107	92,2
44	I re-evaluate my assumptions when I get confused	108	93,1
51	I stop and go back over new information that is not clear.	88	75,9
52	I stop and reread when I get confused.	103	88,8
	Average	103	89

Table 7 describes about Regulation of Cognition for Debugging Strategies. The average for this part was 89 % (103 out of 116 students). The highest result showed that the students asked others for help when they did not understand something (Statement No. 25 = 94,8 %; 110 out of 116 students). While 75,9 % of the students (88 out of 116 students) stopped and went back over new information that was not clear (Statement No. 52).

Table 8. Answers to Evaluation

Item	Statement	Total Respondents (out of 116)	Percentage (%)
7	I know how well I did once I finish a test.	103	88,8
19	I ask myself if there was an easier way to do things after I finish a task.	103	88,8
24	I summarize what I've learned after I finish.	83	71,6
36	I ask myself how well I accomplish my goals once I'm finished.	108	93,1
38	I ask myself if I have considered all options after I solve a problem.	103	88,8
50	I ask myself if I learned as much as I could have once I finish a task.	107	92,2
	Average	101	87,2

From Table 8, 93,1 % of the students (108 out of 116 students) asked themselves how well they accomplished their goals once they were finished (Statement No. 36). While, only 71,6 of them (83 out of 116 students) answered that they summarized what they have learned after they finished (Statement No. 24). As a result, the average for this part was 87,2 % (101,2 out of 116 students).

Metacognitive Awareness Inventory Comparison for Freshman and Senior Students

Below are given Knowledge about Cognition and Regulation of Cognition for Freshman and Senior Students in the English Education Study Program at Faculty of Teacher Training and Education, *Universitas Riau Kepulauan*. Overall, the average for Knowledge about Cognition for Freshman Students was 79,2 % and for Senior Students was 84,6 %. Whereas, the average for Regulation of Cognition for Freshman Students was 82,8 % and for Senior Students was 89,6 %. The detail information is given below:

Knowledge about Cognition for Freshman and Senior Students
Knowledge about Cognition is divided into three parts: Declarative Knowledge, Procedural Knowledge, and Conditional Knowledge. The next part gives a thorough explanation for each statement.

Table 9. Comparison for Declarative Knowledge between Freshman and Senior Students

Item	Statement	Freshman Students		Senior Students	
		Total Respondents (out of 34)	Percentage (%)	Total Respondents (out of 17)	Percentage (%)
5	I understand my intellectual strengths and weaknesses,	29	**85,3**	14	**82,4**
10	I know what kind of information is most important to learn.	29	**85,3**	16	**94,1**
12	I am good at organizing information.	21	**61,8**	11	**64,7**
16	I know what the teacher expects me to learn.	30	**88,2**	15	**88,2**
17	I am good at remembering information.	20	**58,8**	8	**47,1**
20	I have control over how well I learn.	29	**85,3**	11	**64,7**
32	I am a good judge of how well I understand something.	24	**70,6**	14	**82,4**
46	I learn more when I am interested in the topic.	31	**91,2**	17	**100,0**
	Average	27	**78,3**	13	**77,9**

Table 9 shows that the average for Declarative Knowledge of Freshman Students was higher than Senior Students. The highest results for both levels were in learning more when they were interested in the topic (Statement No. 46) as much as 78,3 % and 100 %. While, the lowest results for both levels were also the same that they were not good in remembering information (Statement No. 17 = 58,8 % and 47,1 %).

Table 10. Comparison for Procedural Knowledge between Freshman and Senior Students

Item	Statement	Freshman Students		Senior Students	
		Total Respondents (out of 34)	Percentage (%)	Total Respondents (out of 17)	Percentage (%)
3	I try to use strategies that have worked in the past.	31	**91,2**	16	**94,1**
14	I have a specific purpose for each strategy I use.	28	**82,4**	16	**94,1**
27	I am aware of what strategies I use when I study.	24	**70,6**	16	**94,1**
33	I find myself using helpful learning strategies automatically.	24	**70,6**	14	**82,4**
	Average	27	**78,7**	16	**91,2**

Senior Students had a higher average in Procedural Knowledge compared to Freshman Students, as indicated in Table 10. The best outcome for Freshman Students came from trying to use strategies that have worked in the past (Statement No. 3) as high as 91, 2 %. While, for Senior Students, they were generally good at trying to use strategies that have worked in the past, having a specific purpose for each strategy they used and were aware of what strategies they used when they studied (Statement No. 3, 14, 27 = 94,1 %).

Table 11. Comparison for Conditional Knowledge between Freshman and Senior Students

Item	Statement	Freshman Students		Senior Students	
		Total Respondents (out of 34)	Percentage (%)	Total Respondents (out of 17)	Percentage (%)
15	I learn best when I know something about the topic.	27	**79,4**	15	**88,2**
18	I use different learning strategies depending on the situation.	26	**76,5**	16	**94,1**
26	I can motivate myself to learn when I need to.	32	**94,1**	15	**88,2**
29	I use my intellectual strengths to compensate for my weaknesses.	29	**85,3**	14	**82,4**
35	I know when each strategy I use will be most effective.	23	**67,6**	12	**70,6**
	Average	27	**80,6**	14	**84,7**

In Table 11, it shows that Senior Students had a higher average in Conditional Knowledge than Freshman Students. Freshman Students exceled in motivating themselves to learn when they needed to (Statement No. 26 = 94,1 %). On the other hand, Senior Students were best at using different learning strategies depending on the situation (Statement No. 18 = 94,1 %). Neither of the levels were performing well in knowing when each strategy they used will be most effective (Statement No. 35).

Table 12. Metacognitive Awareness Inventory Comparison for Freshman and Senior Students (Knowledge about Cognition)

Conditional	Freshman (Percentage = %)	Senior (Percentage = %)
Declarative	78,3	77,9
Procedural	78,7	91,2
Conditional	80,6	84,7
Average	79,2	84,6

From Table 12, it shows that the highest result from the Freshman Students was in Conditional Knowledge (80,6 %). While for Senior Students, the highest result was in Procedural Knowledge (91,2 %). The lowest results for both Freshman and Senior Students were in Declarative Knowledge. 78,3 % for Freshman Students and 77,9 % for Senior Students. There was a difference in the average from Freshman to Senior Students. It means that the students had more Knowledge about Cognition in their Senior years.

Regulation of Cognition for Freshman and Senior Students

The Regulation of Cognition comprises five components: Planning, Comprehension Monitoring, Information Management Strategies, Debugging Strategies, and Evaluation. Below is a thorough and detailed explanation for each statement that has been provided.

Table 13. Comparison for Planning between Freshman and Senior Students

Item	Statement	Freshman Students		Senior Students	
		Total Respondents (out of 34)	Percentage (%)	Total Respondents (out of 17)	Percentage (%)
4	I pace myself while learning in order to have enough time.	25	**73,5**	16	**94,1**
6	I think about what I really need to learn before I begin a task.	31	**91,2**	17	**100,0**
8	I set specific goals before I begin a task.	30	**88,2**	16	**94,1**
22	I ask myself questions about the material before I begin.	26	**76,5**	13	**76,5**
23	I think of several ways to solve a problem and choose the best one.	32	**94,1**	15	**88,2**
42	I read instructions carefully before I begin a task.	33	**97,1**	17	**100,0**
45	I organize my time to best accomplish my goals.	29	**85,3**	17	**100,0**
	Average	29	**86,6**	16	**93,3**

Table 13 indicates that Senior Students had a higher average in Planning compared to Freshman Students (93 %). Freshman Students were good at reading instructions carefully before they began a task (Statement No.42 = 97,1 %). Senior students exceled in three parts (100 %); thinking about what they really needed to learn before they began a task (Statement No. 6), reading instructions carefully before began a task (Statement No. 42), and organizing their time to best accomplish their goals (Statement No. 45).

Table 14. Comparison for Comprehension Monitoring between Freshman and Senior Students

Item	Statement	Freshman Students		Senior Students	
		Total Respondents (out of 34)	Percentage (%)	Total Respondents (out of 17)	Percentage (%)
1	I ask myself periodically if I am meeting my goals.	33	**97,1**	16	**94,1**
2	I consider several alternatives to a problem before I answer.	30	**88,2**	17	**100,0**
11	I ask myself if I have considered all options when solving a problem.	30	**88,2**	16	**94,1**
21	I periodically review to help me understand important relationships.	27	**79,4**	15	**88,2**
28	I find myself analyzing the usefulness of strategies while I study.	23	**67,6**	15	**88,2**
34	I find myself pausing regularly to check my comprehension.	27	**79,4**	16	**94,1**
49	I ask myself questions about how well I am doing while learning something new.	31	**91,2**	15	**88,2**
	Average	29	**84,5**	16	**92,4**

Table 14 shows that Senior Students were better at Comprehension Monitoring than Freshman Students (92,4 %). Freshman Students were still low at finding themselves analyzing the usefulness of strategies while they studied (67,6 %), but they were skilled ay asking themselves periodically if they were meeting their goals (97,1 %). In contrast, Senior Students did not have the lowest result but compared to other statements, they were capable in considering several alternatives to a problem before they answered (Statement No. 2 = 100 %).

Table 15. Comparison for Information Management Strategies between Freshman and Senior Students

Item	Statement	Freshman Students		Senior Students	
		Total Respondents (out of 34)	Percentage (%)	Total Respondents (out of 17)	Percentage (%)
9	I slow down when I encounter important information.	17	**50,0**	14	**82,4**
13	I consciously focus my attention on important information.	29	**85,3**	14	**82,4**
30	I focus on the meaning and significance of new information.	29	**85,3**	15	**88,2**
31	I create my own examples to make information more meaningful.	32	**94,1**	16	**94,1**
37	I draw pictures or diagrams to help me understand while learning.	17	**50,0**	9	**52,9**
39	I try to translate new information into my own words.	30	**88,2**	17	**100,0**
41	I use the organizational structure of the text to help me learn.	25	**73,5**	13	**76,5**
43	I ask myself if what I'm reading is related to what I already know.	33	**97,1**	16	**94,1**
47	I try to break studying down into smaller steps.	25	**73,5**	17	**100,0**
48	I focus on overall meaning rather than specifics.	25	**73,5**	14	**82,4**
	Average	26	**77,1**	15	**85,3**

Table 15 indicates that Senior Students had a higher proficiency in Information Management Strategies Monitoring compared to Freshman Students (85,3 %). 50 % of Freshman Students were not proficient at slowing down when they encountered important information (Statement No. 9) and drawing pictures or diagrams to help them understood while learning (Statement No. 37). However, 97,1 % were adept at asking themselves if what they were reading was related to what they already knew (Statement No. 43). Conversely, Senior Students got minor results in drawing pictures or diagrams to help them understood while learning (Statement No. 37 = 52,9 %). Overall, they demonstrated the ability to try to translate new information into their own words (Statement No. 39) and try to break studying down into smaller steps (Statement No.47). Both get 100 %.

Table 16. Comparison for Debugging Strategies between Freshman and Senior Students

Item	Statement	Freshman Students		Senior Students	
		Total Respondents (out of 34)	Percentage (%)	Total Respondents (out of 17)	Percentage (%)
25	I ask others for help when I don't understand something	32	94,1	15	88,2
40	I change strategies when I fail to understand.	28	82,4	17	100,0
44	I re-evaluate my assumptions when I get confused	29	85,3	17	100,0
51	I stop and go back over new information that is not clear.	21	61,8	13	76,5
52	I stop and reread when I get confused.	29	85,3	16	94,1
	Average	28	81,8	16	91,8

From Table 16, it shows that Senior Students had a greater expertise in monitoring Debugging Information Management Strategies than Freshman Students (91,8 %). As many as 100 %, Senior Students were better in changing strategies when they failed to understand, stopping and going back over new information that was not clear (Statement No. 40 and 44). While, for Freshman Students, they were better in asking others for help when they did not understand something (Statement No. 25).

Table 17. Comparison for Evaluation between Freshman and Senior Students

Item	Statement	Freshman Students		Senior Students	
		Total Respondents (out of 34)	Percentage (%)	Total Respondents (out of 17)	Percentage (%)
7	I know how well I did once I finish a test.	28	82,4	15	88,2
19	I ask myself if there was an easier way to do things after I finish a task.	26	76,5	16	94,1
24	I summarize what I've learned after I finish.	25	73,5	10	58,8
36	I ask myself how well I accomplish my goals once I'm finished.	31	91,2	16	94,1
38	I ask myself if I have considered all options after I solve a problem.	30	88,2	15	88,2
50	I ask myself if I learned as much as I could have once I finish a task.	31	91,2	15	88,2
	Average	29	83,8	15	85,3

It is seen from Table 17, that Senior Students were better in Evaluation (85,3 %) compared to Freshman Students (83,8 %). Senior Students got highest results in two parts; asking themselves if there was an easier way to do things after they finished a task and how well they accomplished their goals once they were finished (Statement No. 19 and 36 = 94,1 %). For Freshman Students, they got best results in asking themselves how well they accomplished their goals once they were finished and if they learned as much as they could have once they finished a task (Statement No. 38 and 50 = 91,2 %).

Table 18. Metacognitive Awareness Inventory Comparison for Freshman and Senior Students (Regulation of Cognition)

Regulation	Freshman (Percentage = %)	Senior (Percentage = %)
Planning	86,6	93,3
Comprehension Monitoring	84,5	92,4
Information Management Strategies	77,1	85,3
Debugging Strategies	81,8	91,8
Evaluation	83,8	85,3
Average	82,8	89,6

From Table 18, the MAI comparison for Freshman and Senior Students for Regulation of Cognition, it shows that the highest result from the Freshman students was in Planning Regulation (86,6 %). While for Senior students, the highest result was also in Planning Regulation (93,3 %). Freshman Students still got lowest result in Information Management Strategies (77,1 %). On the contrary, Senior Students got lowest results in two aspects; Information Management Strategies and Evaluation Regulation. Both got 85,3 %. There was a difference in the average from Freshman to Senior Students. It means that the students have more Regulation of Cognition in their Senior years.

DISCUSSION

In answering the first objective of the study, this study indicated that students exhibited higher proficiency in the Regulation of Cognition compared to their Knowledge about Cognition. This suggests that students are generally more adept at managing and controlling their cognitive processes, such as planning, monitoring, and evaluating their thinking and learning strategies, than they are at understanding the underlying principles and mechanisms of these cognitive functions. This is consistent with what MacKewn et al. (2022) indicated that students with high mathematical abilities excel in fulfilling all activities of cognitive regulation during problem-solving tasks. Contrarily, a study focused on the mediation effect of cognition knowledge and regulation on students' mathematics achievement found that knowledge of cognition mediated the relationship between certain aspects of classroom climate and mathematics achievement, highlighting a stronger influence of cognitive knowledge over regulation in academic performance (Dolinting & Pang, 2022).

Moreover, this study resulted that in Knowledge about Cognition, students exceeded in Procedural Knowledge —knowing how to perform tasks and use strategies— than declarative knowledge (knowledge of facts) and conditional knowledge (knowing when and why to use certain strategies). Similar to this, Ramadianti et al. (2020) indicated a predominant focus on procedural knowledge over conceptual knowledge. This emphasis on procedural knowledge suggests that educational practices might benefit from incorporating more explicit instruction on the why and when of strategy use, balancing the development of all facets of metacognitive knowledge. In contrast to this, a study said that declarative knowledge is paramount in understanding cognition. It plays a significant role compared to other knowledge aspects (Nababan, 2006).

Furthermore, the result of this study showed that Comprehension Monitoring stood out as a particularly well-developed skill compared to other aspects such as Planning, Information Management Strategies, Debugging Strategies, and Evaluation. This suggests that comprehension monitoring is a crucial element of cognitive regulation, emphasizing the need for educational interventions to strengthen planning and evaluation skills to create a more balanced and effective approach to metacognitive regulation. In line with this, a research indicated that individuals who excel in comprehension monitoring are more likely to regulate their understanding effectively when faced with inconsistencies at the word and sentence levels, leading to improved reading comprehension outcomes (Baker et al., 2014). A research is in contrast with this statement, it emphasized the importance of planning skills in achieving goals, with interventions compensating for poor planning abilities (Allan et al., 2013).

For the second objectives, this study investigated on the difference in Knowledge about Cognition between Senior and Freshman Students. It revealed a consistent trend: Senior Students typically exhibited higher levels on Knowledge about Cognition. A research by Stanton et al. (2019) found that senior biology students excel in evaluating their overall study plans compared to introductory students, showcasing a deeper understanding of effective learning strategies. However, contrasting in result, (Fauzi & Sa'diyah, 2019) conducted a study on students in Malang who found that while grade levels significantly influenced metacognitive skills, there was no significant difference in metacognitive knowledge between junior and senior students, suggesting a consistent level of metacognitive knowledge across these groups. Despite these variations, the overall trend indicates that as students' progress through their academic journey, they tend to develop a more refined understanding of their cognitive processes.

Lastly, this study also examines on the differences in Regulation of Cognition between Senior and Freshman Students. It exposed that Senior Students had a higher result in Regulation of Cognition compared to Freshman Students. Similar to this statement, a study revealed that high-achieving students in senior high school displayed a higher frequency of metacognitive regulation strategies compared to low-achievers, emphasizing the importance of cognitive regulation in academic success (Nurfadhilah, 2016). Besides, a study said that Junior Students use four self-regulation strategies effectively in assignments. As a conclusion to this, independence learning is crucial for enhancing cognitive aspects in juniors (Bernanda, 2021).

CONCLUSION

Metacognitive Awareness Inventory (MAI) of Students in the English Education Study Program at Faculty of Teacher Training and Education, *Universitas Riau Kepulauan* for Knowledge about Cognition is 82,5 % (96 out of 116 students) and their Regulation of Cognition is 87,5 % (101 out of 116 students). For comparing Freshman and Senior Students, there is an increment for both Knowledge about Cognition and Regulation of Cognition. Knowledge about Cognition for Freshman Students is 79,2 %. While, for Senior Students, the average of Knowledge about Cognition is 84,6 %. The last part is comparing their Regulation of Cognition. Freshman Students get the average 82,8 % and the Senior Students is 89,6 %. It also has increment here. Findings from this research are anticipated to lay the groundwork for the development of more effective educational strategies to enhance students' metacognitive awareness at various stages of their studies. This could further support efforts to improve the quality of English language learning within higher education settings.

REFERENCES

Abdelrahman, R. M. (2020). Metacognitive awareness and academic motivation and their impact on academic achievement of Ajman University students. *Heliyon*, *6*(9), 1–8. https://doi.org/10.1016/j.heliyon.2020.e04192

Allan, J. L., Sniehotta, F. F., & Johnston, M. (2013). The Best Laid Plans: Planning Skill Determines the Effectiveness of Action Plans and Implementation Intentions. *Annals of Behavioral Medicine*, *46*(1), 114–120. https://doi.org/10.1007/s12160-013-9483-9

Baker, L., Zeliger-Kandasamy, A., & DeWyngaert, L. U. (2014). Neuroimaging Evidence of Comprehension Monitoring. *Psychological Topics 23*, *1*, 167–187. https://hrcak.srce.hr/file/178358

Bernanda, L. K. S. (2021). Junior Students' Self-Regulation Strategies in Dealing with Assignments. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, *9*(1), Article 1, 30-44. https://doi.org/10.24256/ideas.v9i1.1767

Bessy, M., & Knouse, S. (2020). Metacognition, Metalinguistic Awareness, and Relevance in Language learning: A Report on an Intervention Module Project. *International Journal for the Scholarship of Teaching and Learning*, *14*(2), 1–10. https://doi.org/10.20429/ijsotl.2020.140209

Dolinting, P. P., & Pang, V. (2022). The Classroom Climate, Students' Mathematics Achievement, Students' Knowledge of Cognition and Regulation Cognition: A Mediation Analysis. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, *7*(6), Article 6, 1-19. https://doi.org/10.47405/mjssh.v7i6.1533

Doyle, B. (2013). Metacognitive awareness: Impact of a metacognitive intervention in a pre-nursing course. *LSU Doctoral Dissertations. Louisiana State University and Agricultural and Mechanical College*. https://doi.org/10.31390/gradschool_dissertations.2644

Fauzi, A., & Sa'diyah, W. (2019). Students' Metacognitive Skills from the Viewpoint of Answering Biological Questions: Is It Already Good? *Jurnal Pendidikan IPA Indonesia*, *8*(3), Article 3, 317-327. https://doi.org/10.15294/jpii.v8i3.19457

Frolova, A. (2022). Metacognitive Awareness as a Destructive Risk Factor Prevention in Educational Environment. *Proceedings of International Forum Teacher Education-2021*, *Russia, 5*, 407–418. https://doi.org/10.3897/ap.5.e0407

Hassan, S., Venkateswaran, S. P., Agarwal, P., & Sulaiman, A. R. (2023). Metacognitive Awareness and Its Relation to Students' Academic Achievement: Time to Ponder Its Implication in Delivery of Curriculum. *Education in Medicine Journal*, *15*(4), 53–65. https://doi.org/10.21315/eimj2023.15.4.4

In'nami, Y., & Koizumi, R. (2022). The Relationship Between L2 Listening and Metacognitive Awareness Across Listening Tests and Learner Samples. *International Journal of Listening*, *36*(2), 100–117. https://doi.org/10.1080/10904018.2021.1955683

Ivanchei, I. I., & Servetnik, M. (2023). Metacognitive awareness is needed for analogical transfer between dissimilar tasks. *Journal of Cognitive Psychology*, *35*(1), 110–124. https://doi.org/10.1080/20445911.2022.2115501

Jariyah, I. A., & Ummah, K. (2022). Kesadaran Metakognitif Mahasiswa pada Perkuliahan Sistem pada Hewan dengan Penugasan Berbasis Portofolio dan Jurnal Belajar. *Bioscientist : Jurnal Ilmiah Biologi*, *10*(2), 1209–1217. https://doi.org/10.33394/bioscientist.v10i2.6719

Kaivanpanah, S., Alavi, S. M., & Rafsanjani Nejad, S. (2019). Depth of Processing in Different Instructional Conditions and Iranian Learners' Interpretation of English Inversion Structures. *Journal of Modern Research in English Language Studies*, *6*(3), 32–1. https://doi.org/10.30479/jmrels.2019.11445.1422

Kessler, M. (2021). The longitudinal development of second language writers' metacognitive genre awareness. *Journal of Second Language Writing*, *53*, 100832. https://doi.org/10.1016/j.jslw.2021.100832

Leung, P. (2017). Focus on content-based language teaching. *International Journal of Bilingual Education and Bilingualism*, *20*(5), 604–606. https://doi.org/10.1080/13670050.2015.1126987

MacKewn, A., Depriest, T., & Donavant, B. (2022). Metacognitive Knowledge, Regulation, and Study Habits. *Psychology*, *13*(12), 1811–1821. https://doi.org/10.4236/psych.2022.1312112

Mendoza, J. A., Elepaño, C. J. T., Mendoza, J. A., & Elepaño, C. J. T. (2023). Metacognitive awareness levels of pre-service teachers. *World Journal of Advanced Research and Reviews*, *17*(3), Article 3. https://doi.org/10.30574/wjarr.2023.17.3.0393

Moshman, D. (2018). Metacognitive Theories Revisited. *Educational Psychology Review*, *30*(2), 599–606. https://doi.org/10.1007/s10648-017-9413-7

Nababan, M. R. (2006). Investigating Declarative Knowledge of Professional Translators. *Kajian Linguistik Dan Sastra*, *18*(2), Article 2, 101-112. https://doi.org/10.23917/kls.v18i2.5054

Nurfadhilah, G. (2016). The Investigation of Students' Metacognition in Reading Comprehension. *Journal of English and Education*, *4*(1), Article 1, 23-39. https://ejournal.upi.edu/index.php/L-E/article/view/4618

Ramadianti, W., Priatna, N., & Kusnandi, K. (2020, July 30). *Procedural Knowledge Versus Conceptual Knowledge of Fraction: An Indonesian Junior High School Case Study*. Proceedings of the 7th Mathematics, Science, and Computer Science Education International Seminar, MSCEIS 2019, 12 October 2019, Bandung, West Java, Indonesia. https://eudl.eu/doi/10.4108/eai.12-10-2019.2296501

Rinaldi, R., & Rahmatillah, F. (2022). Metacognitive Awareness in Students. *Jurnal Neo Konseling*, *4*(4), Article 4, 15-20. https://doi.org/10.24036/00692kons2022

Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, *19*(4), 460–475. https://doi.org/10.1006/ceps.1994.1033

Silistraru, N., & Vetrila, S. (2023). Metacognition as a component of intelligent behavior. *Vector European*, *2*, 124–128. https://doi.org/10.52507/2345-1106.2022-2.25

Stanton, J. D., Dye, K. M., & Johnson, M. (2019). Knowledge of Learning Makes a Difference: A Comparison of Metacognition in Introductory and Senior-Level Biology Students. *CBE—Life Sciences Education*, *18*(2), 1–13. https://doi.org/10.1187/cbe.18-12-0239

Syahidah, I., Suryati, N., & Muniroh, S. (2023). Metacognitive Reading Strategies Awareness in English Language Context among Aviation Cadets. *The Journal of English Literacy Education: The Teaching and Learning of English as a Foreign Language*, *10*(1), Article 1, 93-109. https://doi.org/10.36706/jele.v10i1.20998

Tuononen, T., Hyytinen, H., Räisänen, M., Hailikari, T., & Parpala, A. (2023). Metacognitive awareness in relation to university students' learning profiles. *Metacognition and Learning*, *18*(1), 37–54. https://doi.org/10.1007/s11409-022-09314-x

Üstünbaş, Ü., & Alagözlü, N. (2021). Efficacy Beliefs and Metacognitive Awareness in English Language Teaching and Teacher Education. *Bartın Üniversitesi Eğitim Fakültesi Dergisi*, *10*(2), 267–280. https://doi.org/10.14686/buefad.828035