Results of Assessment of Students' Reading Metacognitive Skills

Mijid Ichinnorov✉
Department of Educational Research Methodology
School of Humanities, Global Leader University, Mongolia
ichinnorov.mijid20@gmail.com

Abstract. Many countries set their educational goal in line with the approach of "21st-century students are self-managed learners" and lead students' skills, development, and mentality towards this tendency scientists' focuses are, also, concentrating on this, and metacognitive skills research is becoming important. This research has an advantage as it looked at reading metacognitive skills during planning, monitoring, and assessment processes. The Goal of the research is to look at understanding and definition of metacognition proposed by scientists, from an academic point of view as well as at analyzing meta knowledge and skills during the reading processes of students studying different majors at universities and institutes. Although the metacognitive reading skills of 370 students who participated in the research have improved compared to the previous research, the research result showed that there is a need to pay attention to processes of recognizing whether they are learning, monitoring, and knowing that they are not learning and changing their strategy during reading.

Keywords: Components metacognitive reading · Metacognitive knowledge · Metacognitive skill · Metacognitive strategy · Metacognitive experience and metacognition concept (understanding)

1 Introduction

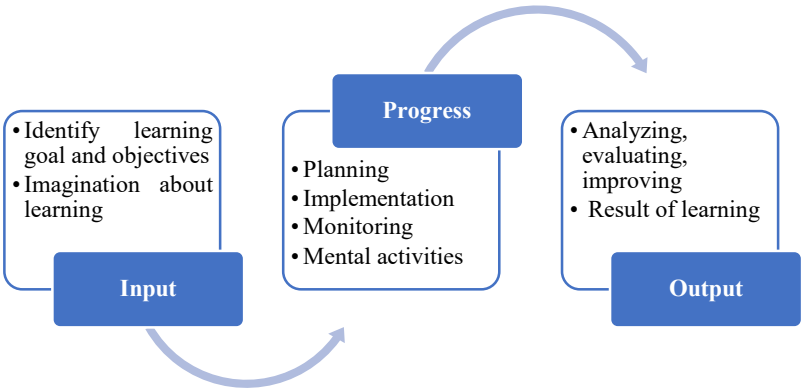
Cognitive knowledge and skills of human beings can be considered as the most important amongst knowledge through processes of gaining knowledge and recognizing which knowledge is the most important is hard to imagine. Therefore, developing their cognitive knowledge, and skills, planning their learning process, self-management, monitoring their learning processes, and evaluating one of the urgent agenda for 21st century students. This research clarified the definition and understanding of cognition of scientists who conducted a study in this area, proposed their ideas, identified steps of metacognition development, came up with a structure of metacognitive reading skills, and studied metacognitive reading skills based on LASSI (Learning and study strategies inventory) [1] and made conclusions in the result of students' self-assessment.

What is Metacognitive skill? Metacognitive skill is an important criterion for learners and students and reality shows that the development of each child is different. The development of metacognitive skills is becoming one of the factors influencing the successful study of learners directly. *Metacognitive skill and development level of self-consciousness.* Students can answer the questions themselves: why do I need to know this?, how do I do this?, how did I learn?, what do I do next?

Flavell considered metacognition as the ability of human beings to understand, M.Kapp defined it as the internal world of mind and viewed it as a strategy of the human mind to mainstream the learning process whereas M. Presley viewed it as the ability of a human being to resolve tasks of how to study, how to understand, how to motivate themselves to study, how to produce knowledge. He viewed it as self-awareness of ones learning process. [2]. Also, the ability to be ready for any situation in one's life was viewed as a metacognitive skill. [3] Metacognition is reflexive internal knowledge about strategy and cognitive tasks contextualized in various situations [4]

Metacognitive skill as the self-managed cognitive process has a structure which consists of input, process, and output.

H. Batmend and O. Ganbold (eds.), *Proceedings of the Conference on Quality Assurance in Higher Education: Transforming Education-new Generation of Learners (QAHE 2023)*, Atlantis Highlights in Social Sciences, Education and Humanities 18,
https://doi.org/10.2991/978-94-6463-382-5_9



Picture 1.Main stages of metacognitive process

Reading metacognitive skill is a unity of qualities and capacities that defines a learner's reading skill level related to "how to read", "recognize how he or she is reading", and "assessing whether they achieved their goal".

Metacognitive knowledge. According to A. Brown, metacognition is knowledge of human being about his or her knowledge [5]. Knowledge about managing our learning process is a necessity. A precondition for this is recognizing oneself starting from the knowledge of who I am, what kind of learner I am, how well I am equipped with learning strategy, how well I choose and use learning strategies to the knowledge of complete self–monitoring of learning activities of themselves and coordinating it. In particular, students studying the teaching profession know how well they gained the knowledge about understanding and using terms related to teaching and the science of psychology, recognize general methods and principles of science, understand the nature and principles of teaching, know children, know the level of their knowledge they gained on how to approach child development from a scientific point of view and how to deepen it.

Metacognitive experience is the skill of managing own activities, especially thinking openly and self-monitoring in specific situations. This means that people usually know what they know, in other words, they monitor their knowledge and evaluate it and it is expressed by levels of planning, selecting, and implementing strategies to enhance their knowledge. In the experience of metacognition, self-monitoring of own knowledge has a special place. Scientists highlighted this as a "precondition of cognitive skills" [6]. Metacognitive strategy is a method to change own cognition completely and skills related to restructuring own attention, self-management self-mobilization, and self-evaluation. Especially, knowledge of the strategy is the basis of understanding the process. Understanding is the result of processes of realizing, converting, taking an example, categorizing, generalizing, concluding, comparing, and explaining. Requiring students to identify relevant information from reading material, check it, reflect on it, and make a decision is the most suitable strategy. If readers have the right understanding of what they read, it means that the level of their meta-understanding is high [7]. A low level of understanding is an expression of poor skill in managing and coordinating of reading process [8]. Metacomprehension of reading. It can be said that understanding is something that comes not only through emotions, and feelings but, also, through reflection and analysis. It requires understanding meaning and making connections to understand it. It shows that content expresses the meaning whereas reflection looks at it in connections.

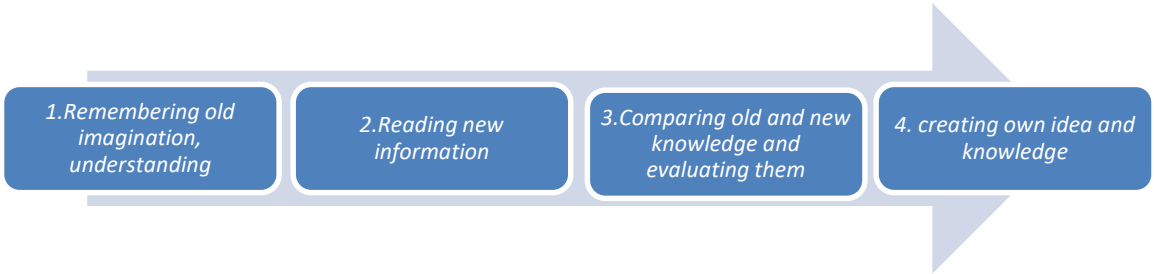
Therefore, students will perform tasks such as analyzing, separating important and not important things, and identifying core meaning successfully. Metacomprehension of reading is the reader's skills on how well he or she gained the ability to reflect, identify core meaning, explain using synonyms and similar ideas, and express his or her ideas. According to some researchers, reading meta-comprehension is the reader's skill to understand the hidden meaning of the text using a metacognitive reading strategy. (Ahmadi, Hairul, & Pourhossein, 2012) A good understanding of a reader depends on his or her knowledge and strategy of cognitive processing and the reader's abilities to use strategy systematically, develop a hypothesis, and ask questions are important [9]. The consciousness of a skilled reader and the self-monitoring, process of understanding is key to the strategy as was highlighted in their research [10]. According to Western researchers, the better metacognitive skills the better intellectual quality and survival skills. Development of metacognition shows good adaptability, reflection, right decision-making even in the face of urgent challenges, and identifying own goal. Therefore,

teaching this skill to children from their early years should be a training goal of schools and the training process should lead towards this. The level of cognitive experience and strategy of young students of schools aged 11-12 is based on their memory and there is a need to pay attention to their selection of strategy and better coordination skills in their learning. Giving direct instruction on how to do things is more effective in developing their metacognition. With higher grades study, it is important that program methodology leads to this development of students' metacognition. Universities and institutions students will have learned to choose their learning style and strategies and manage and coordinate their learning process.

Reading metacognitive skills

Self-monitoring of own cognitive process during reading and checking his or her knowledge is reading metacognition. Reading activity as one of humans' important cognitive actions is a highly important strategy according to research on metacognitive skills [11]. Reading cognitive strategy is a tool to monitor their reading process and to assess the impact of cognitive strategy [12]. Understanding of reading metacognition is the skill of a reader to read the source material, reflect on it, and come up with their idea. Criteria for reading skill is the ability to express the meaning of the text in connection with their idea, not just identifying the core meaning of the text. The steps of creating knowledge during the reading process are seen as the following:

Scheme. Knowledge creation during the reading process



It is effective to use the questioning strategy before, during, and at the end of the reading process in creating knowledge. The key factor that affects metacognitive reading is the learner's strategy to learn, gather information according to his or her need, select reading method, organize reading activities, assess own reading activities, and make conclusions. Reading metacognitive skills are:

- Need and Interest in reading
  - Preparation for reading
  - Defining a goal for reading
- Reading metacognitive skills. It includes learner's strategy to organize their reading process, and skills to work, process and use information,
  - selection of reading strategy
  - – monitoring own reading and understanding processes
  - capture the main idea of the reading material
  - whether the captured main idea is correct or not
  - express the main idea in your own words
  - express the main idea of the reading material through a summarized briefing
  - identify main facts, and use them for approval and explanation
  - conclude reading material
- Personal organization of the reader to manage, monitor, and evaluate his reading activities includes the following skills:
  - Allocation of time
  - Assessing whether a goal was achieved or not
  - Knowing whether it needs review/ improvement or not
  - Defining strategies for improvements

2 Method

Methodology of research on students' reading metacognitive skills

Although reading skills research was conducted mainly with a task to read and understand a text, there is a necessity to do research that is based on self-assessment. Reading metacognitive skill has a subjective nature and aims at assessing own skills. Therefore, it gives opportunity to learn about our cognitive activities and assess ourselves consciously. It is a feature of research methodology and it affects the learner's successful study positively, on the other hand. Randomly selected three hundred seventy students aged between 18 and 20 participated in the research.

Out of metacognitive research methodologies, the LASSI (Learning and study strategies inventory) methodology which is used commonly internationally was used. Ten criteria were grouped into three parts and 40 tests that represent these were included.

There are three main components required in studying reading metacognitive skills:

I. Studying reading interest and approach
   This part aims at clarifying reading interests, needs, mindset during the reading process, and self-motivation. 6 questions.
II. There is a questionnaire to study the level of reading meta-skill. It assesses skills of defining own goal, preparing for reading, setting up an environment for reading, knowing strategy to capture a main idea, examining it, expressing it with own words, selecting reading strategy, summarizing information, modeling and mapping, writing briefing notes, separating important and not important ideas, answering questions, comparing information, prioritizing, assessing and approving.
III. Allocation, concentration, support, and assessment of outcome were included in the research on self-management, and coordination skills.

3 Research result and conclusion

The graphic below shows results of the research on reading meta skills of three hundred seventy students selected randomly. All three criteria in the research showed that they are interrelated.

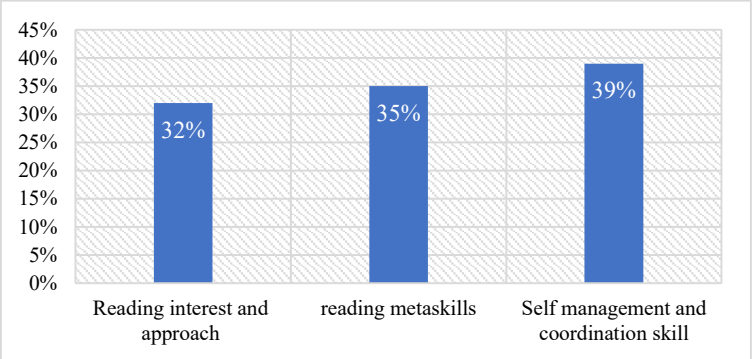


Diagram 1. Reading meta skill's general indicators

Let's look at the above-mentioned skills in line with each indicator.

Research results show that the respondents who stated that reading assignments are interesting 29%, the respondents who stated that they read to know or learn 51%, the respondents who stated that they read because of interest 31%, the respondents who stated they read because it is assignment and required to read is 21%, the respondents that stated that professional materials are hard to read is 32%, the respondents that stated that they suffer when they couldn't do reading homework on time is 37%, the respondents that stated that they are scared to have questions from teachers is 27%. It is concluded that the reading interest of students is at a low level and average.

Judging from reading meta-skill, 36% define their goal before reading, 42% set up the environment for their reading, 21% know a strategy to capture a main idea, 11% examine whether the main idea is accurate or not, 45% express with their own words, 23% choose their reading strategy according to source text, 21% summarize information and make connections, 61% model and map and write a summary, 48% separate important and not important information, 48% accurate response to questions, 32% compare and assess information, 28% make conclusion based on information, 39% approval skill based on information.

According to indicators of self-management, monitoring, and coordination skills, 38% take special time for reading, 26% focus during reading, 57% want to have support and discuss it, 21% monitor whether they understand or not, 47% are scared to make mistakes, 23% assess whether they achieved their goal, 67% want to be assessed by the teacher.

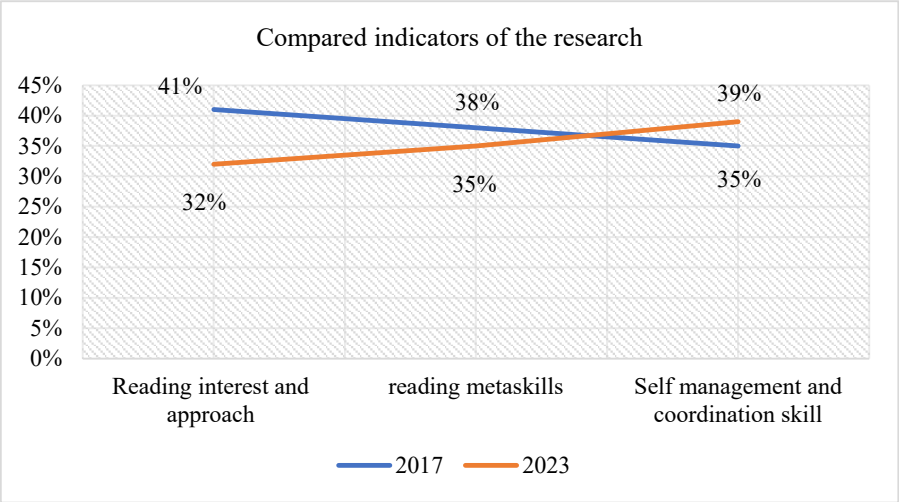


Diagram 2. Research comparison

It shows that self-management skill is improved, and reading interest and reading meta-skill indicators are decreased compared to the research in 2017. Having such low assessment on reading meta-cognitive skill is a feature of the Z generation and it is connected with the fact that they read a book less compared to the previous generation, like immediate action, and are capable of analyzing maps, models, and schemes that show logics, real depiction, digital information, cause and effect, relationship and connections, and don't like reading, are not interested in reading books with many pages, sometimes they don't understand. Progress in self-management is associated with their independent nature.

Table 1. Indicator of assessment credibility

	Quantitative indicator
Number of students	370
Cronbach's alpha	.335

It can be considered that the rate of credibility is relatively good judging from the calculation of Cronbach's alpha coefficient which is .335 based on above mentioned data to demonstrate assessment credibility. Based on the fact that students who participated in the research had a positive attitude and responded to the questionnaire fully, it can be seen that the research has validity. Research results prove that the key three factors are reading metacognitive indicators. These criteria are interesting in reading, attitude, reading meta-skill, self-management during the reading process, and coordination, and they are interrelated. Students' skill of understanding is directly related to reading meta-cognitive skill level.

4 Conclusion

Reading is essential activity for students' learning. Therefore, there is an opportunity to bring a qualitative change in their cognition when reading is studied in association with metacognitive skills. The following conclusions were made as result of the research. They are:

1. Developing knowledge creation stages during reading activity and studying it in association with reading metacognitive skills became indicators for the study.
2. A low level of indicator of reading interest is the impact of reading metacognitive knowledge. Metacognitive coordination is higher compared to metacognitive skill as can be seen.
3. Methods and solutions to develop meta-cognitive knowledge and skills. There is a need to train students in self-management and it would help them to gain meta-cognitive knowledge. It is effective to use a checklist. By having students work with a checklist, they will have a simple, but effective strategy that can help them to learn to monitor themselves. The strategy will help them not only identify their mistakes but also, be more accurate careful, and active in their activities in feeling themselves and monitoring themselves actively.
    - Judging from the research result, it can be concluded that teachers need to pay attention to teaching students knowledge and metacognitive strategy of reading and processing professional texts and information and improving their teaching methodology continuously.
    - Teachers need to pay attention to students' metacognitive development and include it in their curriculum. Also, the activities and assignments of students need to be at problem-solving level.

To improve students' metacognitive skills in reading a source of professional information, teachers need to:

- Activate and motivate students' interest to read
- Use reading metacognitive strategy
- Teachers teaching majors/ professions use questions exercises and assignments widely before and after reading
- Advise students in planning their self-study, implementing learning strategy of self-management and cooperation
- Change their teaching methodology constantly

Remembering the definition of Bloom's taxonomy which states that cognition first receives and understands, then works to make it knowledge, teachers need to consider learning principles and review teaching objectives.

References

1. Weinstein, C. E., Palmer, D. R., & Acee, T. W, "LASSI User's Manual: For Those Administering the Learning and Study Strategies Inventory (3th ed.)," 2016. [Connected]. Available: https://www.rand.org/.
2. M. Dirkes, " Metacognition: Students in Charge of Their Thinking," *Roeper Review, vol. 8,,* pp. 96-100, 2010. DOI: https://doi.org/10.1080/02783198509552944
3. S.Tobias, H.T.Everson, S.Tobias, H.T.Everson, Handbook of metacognition in education, Routledge, 2009, p. 21.
4. J. M. Villanueva, "Language profile, metacognitive reading," *Cogent Education 9: 2061683,* pp. 1-19, 12 APR 2022. DOI: https://doi.org/10.1080/2331186X.2022.2061683
5. Christian Soto, et al, "Reading comprehension and metacognition: Theimportance of inferential skills," *Cogent Education,* pp. 1-20, 2019.
6. C. Banditvilai, "The Effectiveness of Reading Strategies on Reading," *International Journal of Social Science and Humanity, Vol. 10, No. 2,* pp. 46-50, 2020. DOI: https://doi.org/10.18178/ijssh.2020.V10.1012
7. Mussarrat Azhar, Riffat un Nisa Awan & Shaista Khalid, "University Students' Awareness of Meta-cognitive Reading," *Journal of Educational Sciences & Research Volume 2, No. 1,* pp. 19-32, 2015.
8. C. Banditvila, "The Effectiveness of Reading Strategies on Reading," *International Journal of Social Science and Humanity, Vol. 10, No. 2, ,* pp. 46-50, May 2020. DOI: https://doi.org/10.18178/ijssh.2020.V10.1012
9. J. Devine, "The role of metacognition in second language reading and writing," %1-д *The role of metacognition in second language reading and writing.*, Boston, Heinle & Heinle. , 1993.
10. A.L.Brown, "Metacognition, executive control, self-regulation and other more mysterious Mechanisms," %1 *Brown.A.L*, New Jersey,, 1987.
11. Ts.Burmaa, Importance of metacognitive and cognitive structures in learning a language abroad, "*Lavai-International journal of education",vol.6, p.104-107 , 2011.*
12. Joey M. Villanueva, " Cogent Education," 12 Apr 2022. [Connected]. Available: https://doi.org/10.1080/2331186X.2022.2061683

13. S. G. a. K. Muth., “Reading and Writing to Learn Science”, *Research in Science Teaching, vol. 29,,* pp. pp 35-49, 1994.
14. Tracy Linderholm, Adam Wilde, “College Students' Beliefs about Comprehension When Reading for Different Purposes,” *Journal of College Reading and Learning,* 2014.
15. Alexander, P. A., & Jetton, T. L, Learning from text: A multidimensional and developmental perspective. Handbook of reading research, 2000.
16. R. H. Kluwe, Executive decisions and regulation of problem solving behavior. Metacognition, Motivation, and Understanding, 1987.
17. Ahmadi, Hairul, & Pourhossein, “ Reciprocal teaching as an important factor of improving reading,” *Journal of studies in education, 2(4),* pp. 153-173, 2012. DOI: https://doi.org/10.5296/jse.v2i4.2584
18. Mohammad Reza Ahmadi, Hairul Nizam Ismail, Muhammad Kamarul Kabilan Abdullah, “The Importance of Metacognitive Reading Strategy Awareness in,” *English Language Teaching; Vol. 6, No. 10,* pp. 235-244, 2013. DOI: https://doi.org/10.5539/elt.v6n10p235
19. R.K. Coll, B. France and I. Taylor. , “The Role of Models and Analogies in Science Education: Implications From Research,” *Journal of Science Education vol. 27,* pp. 183-198, 2012. https://doi.org/10.1080/0950069042000276712
20. A. Karbalaei, “METACOGNITION AND READING COMPREHENSION,” Aug 2011. [Холбогдсон]. Available: http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0123-34322011000200001#:~:text=Metacognitive%20reading%20strategies%20are%20conscious,of%20cognitive%20strategies%20being%20used.
21. C C Block, Michael Pressley, Comprehension instruction : research-based best practices, New York: Guilford Press, 2002.