



## Instructions for Writing, Classroom Assessment, and Metacognitive Strategies in Reading: A Structural Equation Approach to Research Skills

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### ABSTRACT

This research examines the relationship between writing instruction, classroom assessment, and metacognitive reading strategies, and their collective impact on college students' research skills. This study identifies a significant gap in the existing literature by analyzing how these factors connect to enhance students' ability to conduct research, a crucial skill for academic success. The study employed a mixed-methods approach, using quantitative analysis to explore the relationship between teaching practices and students' self-reported research skills. The key findings showed that effective writing instruction and formative classroom assessments significantly contribute to enhancing students' research skills. Furthermore, it was demonstrated that metacognitive reading strategies improve comprehension and retention of information necessary for successful research outcomes. The study proposes a structural model that illustrates the direct relationship between these factors, indicating that both writing instruction and classroom assessment are strong predictors of research skill development.

### INTRODUCTION

Making decisions and understanding the social issues being faced is part of the research process. In fact, the traditional research process has not been clearly defined at the college level, which may be caused by difficulties faced by teachers, particularly due to limited teaching time, a large number of students, and a significant proportion of students who are unprepared for research activities (Lazonder & Harmsen, 2018). It was emphasized that students' participation in research is a continuation of the acquisition of knowledge, from new knowledge of the student to that of humanity. However, a study conducted at the University of Kansas, United States, highlighted the emphasis on research skills to avoid reducing student engagement, resulting in short-term retention, low graduation rates, persistence in chosen fields, and a decrease in enrollment in graduate schools (Dvorak & Hernandez, 2020).

Research is vital for the economic development of any country. He further stated that research leads to inventions, innovations, and the creation of new technologies and products that help improve and solve various political, socio-economic, cultural, technological, and environmental issues. However, research requires human resources to develop skills and knowledge (Frantzen, 2000). It has been established that colleges play an important role in performance and disseminating knowledge, providing the necessary research skills to students and preparing them for social knowledge (Shanaham, 2017). It was also affirmed that research skills are described as the ability to identify problems, identify the correct sources of information, gather good information sources, assess the quality and relevance of information, and effectively utilize information to solve

problems (Badke, 2011).

In a study conducted, attention was given to the variables affecting students' research skills. The first variable is writing instruction. The purpose of the study is to determine the relationship between writing instruction and students' research skills. It was found that academic intrinsic motivation has a significant and positive relationship with student engagement. However, based on previous research, the intensity of the relationship is expected to be high (Bazerman *et al.*, 2017). Furthermore, classroom assessment has a significant relationship with student engagement; this was confirmed in their theoretical assumption that classroom assessment is an important predictor of research skill. Additionally, metacognitive reading strategies show a strong relationship with students' research skills as emphasized in studies supporting the conclusion that valuing intensive metacognitive reading enhances student skills towards research (Wajid & Jami, 2020).

However, in the aforementioned situations and to the knowledge of the researcher, no local studies have been conducted to determine whether there is a relationship between writing instruction, classroom assessment, and metacognitive reading strategies and students' research skills. Only a few studies mentioned the relationship between writing instruction, classroom assessment, and metacognitive reading strategies and research skills. Hence, the researcher is motivated to conduct a study to help raise awareness regarding various skills to become proficient in research writing and to achieve the goal of providing quality and high education and enhance the results of its academic program. Thus, this study aims to address these identified gaps.

In the study by Hamdan-Alghamdi *et al.* (2018), the results

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indicated that active learning significantly improved the overall skills of participants, as evidenced by increased final exam scores and individual skills in writing, reading, and research. The research discusses both high and low skills, as well as the pedagogical implications for teaching writing and research using active learning. Ehri and Flugman (2018) proved that guiding teachers can help them enhance their classroom assessment skills, which may impact student performance.

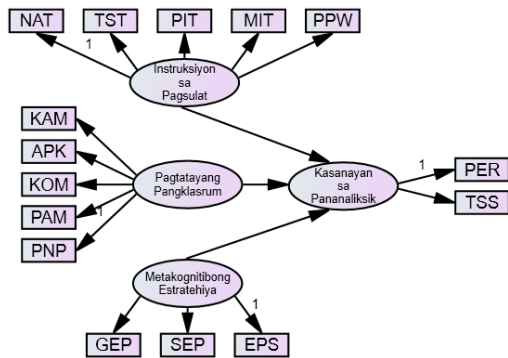
The primary theory in this study is Social Constructivism and Writing and Control-Value Theory. The constructivist theory believes that students better understand the information of a lesson they construct themselves. Ozer (2004) states that learning is a social advancement involving language, reality, and the interaction and collaboration of students. In a constructivist setting, the teacher acts as a manager and guide, planning, organizing, directing, and instructing students. Students are responsible for their own learning. Jean Piaget and Lev Vygotsky are two significant proponents of this theory, though they have differing views. Understanding these two perspectives greatly aids in comprehending how a constructivist environment significantly contributes to learning within the classroom. Piaget advocates Cognitive Constructivism, believing that students create knowledge through learning activities. While engaged in class activities, students draw conclusions and discover valuable ideas in their minds. Piaget's developmental learning theory and constructivism are based on discovery. The study emphasized a theory anchored in genre pedagogy developed in Australia in the 1980s based on Halliday's Systemic Functional Linguistics (Cope & Kalantzis, 2012; Kress *et al.*, 2014). According to genre pedagogy, the key features of genres are revealed through training in text models that help students learn and master the genres necessary for success and advancement in society (Cope & Kalantzis, 2012). In this context, various cycles of teaching have been developed, with the primary stages including: First, deconstruction of text model construction; second, joint construction; and finally, independent construction (Cope & Kalantzis, 2012). In this approach, the process of inquiry, including feedback, is seen as part of the writing teaching process, forming a robust concept within education and educational research.

The survey is divided into two parts: Writing Instruction – Teaching Writing and addressing how writing is taught in the classroom, related to the modeling stage of the teaching-learning cycle. The latter discusses how teachers can monitor writing through feedback, contributing to supporting students in developing their writing skills, related to the third stage of the teaching-learning cycle. Classroom assessment is based on a theoretical foundation of empirical investigations referring to a behavior of a stable characteristic of an individual evidenced by a specific way of responding or behaving in all situations. The behavior and attitudes of students towards classroom assessment are conceptualized to build the following elements: First, engagement in planning

learning – students affirm that assessment activities align with the goals, objectives, and tasks of the study program. Second, authenticity – students indicate that assessment activities feature real-life situations relevant to them as learners. Third, student consultation – students affirm they are consulted and informed about the forms of assessment tasks used. Fourth, transparency – the goals and forms of assessment tasks are affirmed by students to be well-defined and clarified; and finally, accommodation and diversity of students – students assert that everyone has equal opportunities to complete assessment tasks (Kerlinger, 1986). Metacognitive reading strategies are anchored in Goodman's theory (Jenny *et al.*, 2024), which states that reading is a psycholinguistic guessing game in which the reader reconstructs a message or idea derived from the text read. For him, this activity of making meaning is a continuous cyclical process derived from the text, personal hypotheses or predictions, assessments, confirmations, revisions, and further interpretations. Reading is a complex system of deriving meaning from printed symbols that requires readers to recognize subject knowledge, relate prior knowledge or experience, reading skills, linguistic ability, and motivation (Dechant, 2013).

The gap in this research indicates that studies have been conducted on this matter, but the data published is insufficient. Therefore, this study is important to address the difficulties faced by students in conducting research. Research skills require further study to guide students on how to conduct research easily. This section highlights specific variables that need to be measured in the conducted study. Furthermore, it serves as a guideline for the researcher on what to focus on and what needs to be addressed. Indeed, this study aims to fulfill the following objectives: First, to determine the level of writing instruction in the language of college students based on: narrative text; self-confidence in narrative text; teaching how to write introductions to factual texts; the ability to write introductions to factual texts; and teaching typical formal and informal language; Second, to ascertain the level of classroom assessment of college students based on: alignment with planned learning; authenticity; consultation for students; clarity; and student capability; Third, to identify the level of metacognitive strategies in reading of college students based on: problem-solving strategies; support reading strategies; and global reading strategies; Fourth, to ascertain the level of research skills of college students based on: perception; and self-confidence. Additionally, this research simultaneously aims to identify meaningful relationships between: writing instruction and research skills; classroom assessment and research skills; and metacognitive reading strategies and research skills; Sixth, to determine the combined and unique influence of writing instruction, classroom assessment, and metacognitive reading strategies on research skills, and finally, to identify which model is most appropriate for research skills. Based on the hypotheses formulated, first, there is no significant relationship between: writing instruction and research skills; classroom assessment and

research skills; and metacognitive reading strategies and research skills. Second, writing instruction, classroom assessment, and metacognitive reading strategies do not have significant influence on research skills. Lastly, there is no most suitable model to use for the research skills of college students.



**Figure 1:** The Model Showing the Direct Causal Relationship Between Exogenous Variables: Writing Instruction, Classroom Assessment, and Metacognitive Reading Strategies in Research Skills.

The Hypothesized Structural Model 1 is presented in Figure 1, which illustrates the direct relationship of the exogenous variables: writing instruction, classroom assessment, and metacognitive strategies, as well as their causal relationship with the endogenous variable, research skills. All indices reached acceptable values, as shown in the appendices. However, this model is weak and unsuitable.

To determine the most appropriate model, all indices must fall within acceptable ranges. The chi-square/degrees of freedom value should be less than 5, with a corresponding p-value greater than 0.05. The root mean square error of approximation (RMSEA) value must be less than 0.05, and the corresponding p-close value should be greater than 0.05. Other indices, such as the Normed Fit Index (NFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and the Goodness of Fit Index (GFI), must all be greater than 0.95.

In schools, this has significant implications for providing quality education and addressing the needs of students in the field of research. Through this, students can be developed into individuals with sufficient knowledge and skills, preparing them for global competition. Most importantly, for the school administration, this highlights the need to focus on addressing students' needs to further enhance their research skills by creating programs that nurture students' research competencies or by reviewing the curriculum guide to determine if there is a need to revise or add content to improve students' research skills. Overall, this study will serve as a foundation for future researchers to continue conducting studies related to students' research skills. The results of this study are expected to directly help teachers further improve their teaching strategies in the field of research, providing them with adequate knowledge on what aspects of their

teaching methods need to be retained or modified. For students, this study will aid in fully developing their abilities and skills in conducting research. It will further strengthen their mastery of the competencies they need to learn in research activities and significantly enhance their research skills.

## LITERATURE REVIEW

It is undeniable that having research skills is essential for developing students' abilities. This study focuses on four variables. The literature and studies reflecting the research skills of selected students are highlighted. This study is centered on four variables:

First, writing instruction, based on the study titled English Writing Instruction Questionnaire: The Development of a Questionnaire Concerning English Writing Instruction, Writing Skills and Feedback Practices by Horverak and Haugen (2016). Indicators include narrative text, self-confidence in narrative text writing, realistic text and self-confidence in realistic text writing, writing introductions to realistic texts, and teaching typical formal and informal language.

Second, classroom assessment, derived from the study titled Assessment Practices: Students' and Teachers' Perceptions of Classroom Assessment by Mussawy (2009). Indicators include suitability in learning planning, authenticity, student consultation, transparency, and student capability.

Third, metacognitive reading strategies, based on the study titled Metacognitive Awareness of Reading Strategies of University of Botswana English as Second Language Students of Different Academic Reading Proficiencies by Magogwe (2013). Indicators include problem-solving strategies, support reading strategies, and global reading strategies.

Lastly, research skills, based on the study titled Students' Perceptions toward Academic Competencies: The Case of German First-Year Students by Dana-Kristin Mah and Dirk Ifenthaler (2018). Indicators include perception and self-confidence.

### Writing Instruction

The study's results indicate that strategies focus on writing instruction programs, such as "Tekster," an effective method to improve students' language writing skills at the upper elementary level (Bouwer *et al.*, 2018). While many factors influence children's development as writers, including poverty, genetics, and biological functioning, many children do not receive the appropriate or necessary writing instruction in school (Graham, 2018).

### Classroom Assessment

Classroom assessment involves teachers investigating what and how their students are learning during instruction, often through short questions given at the end of each class, compared to evaluating students' learning outcomes at the end of instruction when there is no longer an opportunity to adjust teaching practices (Ahmadova,

2020). Meanwhile, study results show that teachers have a low level of literacy in classroom assessment. Due to its importance, there is a significant need to improve this aspect. Based on clear results and recommendations from researchers in previous international studies on teachers' classroom assessment literacy, researchers addressed the issue of low assessment literacy by developing relevant training programs (Shams & Iqbal, 2019).

### Metacognitive Reading Strategies

Metacognitive awareness in reading is defined as an individual's awareness of using their cognitive processes, enabling them to become better readers (Girli & Öztürk, 2017). Furthermore, metacognition is an individual's psychological capacity to regulate the thought process to achieve its goals. It is the ability to establish cognitive strategies (Asy'ari & Ikhsan, 2019). Additionally, metacognition is a psychological process that monitors cognition, specifically literacy, by activating reading strategies (Braga & Busnardo, 2017).

Metacognitive reading strategies aim to explore university-level students' proficiency. While proficient readers exhibit positive interaction with higher-level strategies, less proficient readers use them less frequently. Although both proficient and less proficient readers prioritize problem-solving strategies, proficient readers prefer using global strategies, while less proficient ones tend to rely on support strategies (Roohani *et al.*, 2017).

### Research Skills

Research skills in the undergraduate curriculum require additional focus on instruction but are still taught through teacher-directed pedagogical approaches (Hosein & Rao, 2017). Meanwhile, many authors have provided various strategies to develop research skills. They focus on faculty mentorship as a way to impart research skills, arguing that the quality of student research depends on the quality of mentoring they receive (Feldon *et al.*, 2015).

The skills that lead students to think critically and solve problems are research skills. Research skills are acquired through a series of research activities that help students critically evaluate a problem, develop and analyze data, ideas, and hypotheses from relevant data, formulate and test solutions, and successfully draw conclusions. The study's results indicated that active learning significantly improved participants' overall skills, as evidenced by increased final exam scores and individual writing and research skills. The research discusses the strongest and weakest skills, as well as the pedagogical implications for teaching writing and research using active learning (Hamdan-Alghamdi *et al.*, 2018).

## MATERIALS AND METHODS

### Research Participants

The study will be conducted across various programs in universities within the Caraga Region, Philippines, specifically involving students enrolled in research subjects. A total of 400 respondents were selected from

829 students using stratified random sampling. The selected respondents were from four universities:

North Eastern Mindanao State University (187 respondents)

Caraga State University (119 respondents)

Surigao del Norte State University (119 respondents)

Saint Theresa College of Tandag (25 respondents)

Respondents were chosen proportionally to each institution's population size. Stratified random sampling was employed to ensure that groups with similar characteristics were represented. Participation in the study was voluntary, and respondents' data were kept confidential.

### Instrument

The study utilized validated instruments tailored to specific aspects of the research:

English Writing Instruction: Based on genre-pedagogy (Cope & Kalantzis, 2012).

Classroom Assessment: Adapted from previous studies (e.g., Koul, Fisher, & Earnest, 2005).

Reading Strategies: Based on the Survey of Reading Strategies (SORS) by Mokhari and Sheorey (2002).

Research Skills: Modified from instruments used in studies such as Meerah *et al.* (2012).

Reliability testing using Cronbach's Alpha yielded high internal consistency for all instruments, with coefficients ranging from 0.895 to 0.956.

### Research Design and Methodology

The study employs a Structural Equation Model (SEM) to analyze relationships between variables. SEM is suitable for testing hypotheses and identifying causal relationships. The data collection process involves obtaining permissions, pilot testing instruments, and distributing surveys among respondents. The researcher followed a systematic process, including validation by experts, ethics review, and adherence to confidentiality standards. Statistical analyses, including Pearson correlation and multiple regression, were conducted to determine relationships and influences among variables.

### Ethics and Integrity

The study adhered to research ethics, ensuring originality, transparency, and proper acknowledgment of sources. The University of Mindanao Ethics Review Committee reviewed the research to ensure compliance with ethical standards. Respondents' identities and institutions were kept anonymous throughout the study.

## RESULTS AND DISCUSSION

In this section, the data gathered from the results of four variables are presented: instruction in writing the language, classroom assessment, metacognitive strategies in reading, and research skills of college students.

### Level of Instruction in Writing the Language of College Students

The instruction in writing the language includes five

indicators: narrative text, confidence in narrative text, teaching the writing of introductions for factual texts, writing introductions for factual texts, and teaching typical formal and informal language. The responses of the participants from various divisions of Region XI yielded a high descriptive level. This indicates that the instruction in writing the language for college students is an area that deserves attention.

Table 1 shows the level of instruction in writing the

language of college students. The overall mean score was 4.14, with a standard deviation (SD) of 0.47, and a descriptive level of high. The instruction in writing the language of college students, based on the teaching of typical formal and informal language, achieved the highest descriptive level. This means that the use of typical formal and informal language in teaching is significant. The mean score for this indicator was 4.27, with a standard deviation (SD) of 0.63.

**Table 1:** Level of Instruction in Writing the Language of College Students

Indicator	SD	Mean	Descriptive Level
Narrative Text	0.62	4.24	Highest
Self-Confidence in Narrative Text	0.61	3.94	High
Teaching How to Write an Introduction in Informative Text	0.59	4.20	Highest
Able to Write an Introduction in Informative Text	0.59	4.03	High
Teaching the Typical Use of Formal and Informal Language	0.63	4.27	Highest
Total	0.47	4.14	High

The indicator of narrative text received a mean score of 4.24 and a standard deviation of 0.62, with the highest descriptive level. The distribution of the level of instruction in writing the language through narrative text shows that it ranked second with a high score. Following this, the indicator of teaching the writing of introductions to factual texts achieved a mean score of 4.20 and a standard deviation of 0.59, also with the highest descriptive level. Meanwhile, the ability to write introductions to factual texts received a high descriptive level, with a mean score of 4.03 and a standard deviation of 0.59. The indicator of confidence in narrative text received the lowest mean score of 3.94 and a standard deviation of 0.61, with a high descriptive level.

The overall result of this table has a high descriptive level, indicating that these variable needs attention. However, students generally agree more on the indicators of narrative text, teaching the writing of introductions to factual texts, and teaching typical formal and informal language. This means that these three indicators have a significant influence on the students.

The application of the brainwriting strategy is shown to have a significant effect on the success of students in writing narrative texts (Sari, 2018). Additionally, research on the Student Teams Achievement Division (STAD) indicates that it is an effective method for teaching the writing of narrative texts through classroom observations and student texts, demonstrating the development of writing skills in narrative texts. Students are able to write well-organized narrative texts with clear structures and a good understanding of linguistic elements (Gustiana & Santoso, 2019).

This study aligns with previous research indicating that strategies focused on writing instruction programs, such as text writing, are effective in improving students' writing skills in upper elementary grades (Bouwer *et al.*, 2018). While there are many factors influencing children's

development as writers, including difficulties, genetics, and biological functions, many children do not receive the appropriate or necessary writing instruction in school (Graham, 2018).

Two general key findings emerged from twenty-eight studies examining how writing is taught in contemporary classrooms. First, some teachers provide students with a solid writing program, and in some classrooms, this instruction is exemplary. Second, it is not commonly observed that writing instruction is inadequate in most classrooms (Wilcox *et al.*, 2016).

Research findings show that the narrative texts produced by students have become more organized. Through the implementation of peer-editing in the classroom, students can evaluate their peers' work and identify which texts are better organized and what transition words they should use (Nugroho, 2021). In line with this, another researcher states that the peer-editing technique allows students to learn both from revising others' works and the revisions they receive (Muthmainah, 2019).

A researcher's study indicated that at-risk students build their confidence in writing based on the quality of teacher feedback, interest, and topic selection for writing, caring and supportive teachers, explicit writing instruction, and additional support from their teachers. Furthermore, the participants reported a lack of opportunities to write frequently in previous writing courses (fewer than six pages per semester) and did not feel well-prepared for writing assignments at the college level because they were not required to engage in research writing more than twice a semester. These findings support further exploration of writing demands at the college level and the correlation between high school writing experiences and college-level writing performance (Schmidt, 1999).

The principles of a realistic approach in learning activities are as follows: first, student-centered learning; second, learning the students' own concepts; third, avoiding

verbalism; fourth, learning to improve students' cognitive abilities; fifth, learning to enhance both students and teacher motivation; sixth, providing opportunities for students to practice communication skills; and lastly, the process of validating the concepts, laws, and principles developed by students in their cognitive structure (Lazim, 2009).

### Level of Classroom Language Evaluation of College Students

In this section, the results of the study regarding the level of classroom language evaluation of college students are presented. The second table shows the five indicators with a total standard deviation (SD) of 0.47 and a mean score of 4.08, which corresponds to a descriptive level of "high." Table 2 presents the five indicators: alignment with planned learning, realism, consultation for students, clarity, and student ability. The results reveal which indicators received high scores.

Table 2 shows the results from the survey conducted with the study respondents for each indicator related to the level of classroom language evaluation of college students. The indicator of alignment with planned learning has a standard deviation (SD) of 0.53 and a mean score of 4.05, corresponding to a descriptive level of "high." The indicator of realism shows a standard deviation (SD) of 0.51 and a mean score of 4.30, with the highest descriptive level. Meanwhile, the indicator of consultation for students has a standard deviation (SD) of 0.60 and a mean score of 4.09, which corresponds to a "high" descriptive level. The indicator for clarity has a standard deviation (SD) of 0.60 and a mean score of 3.98, corresponding to a "high" descriptive level. The final indicator, student ability, has a standard deviation (SD) of 0.64 and a mean score of 3.99, corresponding to a "high" descriptive level.

**Table 2:** Level of Classroom Language Evaluation of College Students

Indicator	SD	Mean	Descriptive Level
Alignment with Planned Learning	0.53	4.05	High
Realism	0.51	4.30	Highest
Consultation for Students	0.60	4.09	High
Attaining Clarity	0.60	3.98	High
Student Competence	0.64	3.99	High
Total	0.47	4.08	High

In classroom language evaluation, teachers are involved in investigating what and how their students learn during the teaching process, often through brief questions given at the end of each class, as opposed to looking at student learning outcomes at the end of the teaching session when there's no opportunity to alter teaching practices

(Ahmadova, 2020). Meanwhile, the study results showed that teachers have a low level of literacy in classroom assessment, and due to its importance, there is an urgent need to enhance it. Based on clear results and recommendations from previous international studies on teacher literacy in classroom assessment, the researcher addressed the issue of low literacy in classroom assessment by developing a program related to training (Shams & Iqbal, 2019).

The results revealed that teachers create an active learning environment through non-verbal communication, where students become more attentive inside the classroom and actively participate in the learning process, leading to improved retention and understanding. The use of non-verbal communication helped teachers provide a better understanding of the students' learning achievements. In contrast, a teacher who does not use non-verbal communication in the classroom may fail to engage students for more effective learning (Butt & Shafiq, 2017). The classroom is a space for learning, a room where students learn various things. Classrooms are found in various educational institutions, and in the classroom, students learn and hone their skills (Norton, 2017).

The results of this study showed that the students' perceptions of classroom assessment were positive in all aspects, except for their perceptions of their ability to prepare for exams, assignments, and feedback. There were no differences in students' views on classroom assessments based on gender, and the views of students on classroom assessments influenced their attitudes (Syaifuddin, 2019).

A study found that authenticity in what we call the assessment of the generative unit is understood as an evolving process, as opposed to conventional unit tests. We established an innovative assessment practice derived from data from students and teachers, which is described through four features applicable to any part of the content. Through collaborative discussions and the subsequent creation of a generative unit assessment, we identified gaps to truly understand ontological growth and continuous learning through assessment (McFeeters *et al.*, 2021).

The findings from the study revealed that biology students see continuous assessment as highly fair, authentic, and influential on academic performance. The study recommends that teachers involve students in their assessment plans so they can have some level of control over their evaluations (Irede & Akachukwu, 2020). Meanwhile, the data analysis showed that teachers' assessment planning and implementation, as observed by both teachers and students, were not fully provided. Teachers used traditional types of assessments, such as multiple-choice tests, instead of authentic assessments. The limited knowledge and facilities became a problem for English teachers in elementary schools in Pesawaran to implement authentic assessment (Wulandari & Anvaliza, 2018).

The findings from the study suggest that the uses vary

greatly from referencing externally defined skills to student relevance. The findings discuss ideas of culture and personal authenticity to suggest important aspects involved in designing science classroom activities that are authentic across different references. Based on the analysis, we developed a strategy to balance authenticity in science education classroom practices between cultural and personal authenticity (Anker-Hansen & Andree, 2019).

The findings from the study indicated positive reflections from students and teachers regarding beliefs and transparency in assessment. Therefore, assessment will be more effective if it is planned within a reliable structure for proper results following clear assessment standards (Luitel, 2021).

Students have a clear understanding of most aspects of school life, including how they are assessed (Dorman and Knightley 47-58). Students are also concerned about the importance and fairness of assessment tasks, the alignment they feel when in the classroom, and their relevance to their real lives. According to Cavanagh *et al.* (2005), students' views on classroom assessments consist of five main characteristics, including: the appropriateness between assessment and lesson plans, authenticity, student consultation, transparency, and accommodation of student skills. Ideally, students should confirm the following: first, that the assessment task aligns with the goals, objectives, and teaching session; second, that the assessment task is drawn from real life and is relevant to them; third, that students consult and participate in any type of assessment task; fourth, that the goals and form of the assessment task are clearly stated; and lastly, that all students have the same opportunity to complete the assessment tasks. In short, classroom assessment greatly contributes to student learning, where the alignment of learning planning, authenticity, student consultation, transparency, and student capability is essential to achieving students' learning outcomes.

Overall, classroom assessment has a significant impact on student learning. The classroom assessment provided by teachers influences student learning in various fields. It is defined in the study as the process of determining what students know and can do, generally categorized into two broad categories: assessment designed for teaching and learning in the classroom; and program assessments for public reporting, certification, selection, and system accountability. While the concept of literacy assessment continues to be widely used, the number of scholars has expanded the concept beyond teachers' knowledge, understanding, and skills (Barber & Hill, 2014).

### Level of Metacognitive Reading Strategies of College Students

Table 3 presents the overall results of the survey conducted regarding the level of metacognitive reading strategies of college students. This variable has three indicators, where the overall result for the standard deviation (SD) is 0.40, with a mean score of 4.37, corresponding to the highest descriptive level.

**Table 3:** Level of Metacognitive Reading Strategies of College Students

Indicator	SD	Mean	Capitalization error
Problem-Solving Strategies	0.42	4.56	Highest
Support Reading Strategies	0.50	4.28	Highest
Global Reading Strategies	0.47	4.26	Highest
Total	0.40	4.37	Highest

Table 3 shows the results of each indicator related to the survey on metacognitive reading strategies of college students. In the first indicator related to problem-solving strategies, the standard deviation (SD) is 0.42 and the mean score is 4.56, which received the highest descriptive level. Meanwhile, the indicator related to supportive reading strategies has a standard deviation (SD) of 0.50 and a mean score of 4.28, which also received the highest descriptive level. Meanwhile, the indicator related to global reading strategies has a result of a standard deviation (SD) of 0.47 and a mean score of 4.26, which received the highest descriptive level.

Metacognitive awareness in reading is defined as individuals' awareness of using their cognitive processes, enabling them to become better readers (Girli & Öztür, 2017). Moreover, metacognition is a psychological capacity of an individual to regulate the thinking process to achieve the goal of thinking. It is the ability to establish a way of thinking or cognition (Asy'ari & Ikhsan, 2019). Additionally, metacognition is a psychological process that monitors cognition, related to literacy, referring to the activation of reading strategies (Braga & Busnardo, 2017).

This study aligns with encouraging readers to think of metacognitive strategies as inputs in constructing reading comprehension materials and syllabi based on planning, monitoring, and evaluating students' strategies to enhance reading skills for better student comprehension of texts according to their needs, as well as teachers scaffolding to improve reading and comprehension skills (Channa *et al.*, 2015).

It has been found that metacognitive strategies assist individual students in understanding the learning skills they need to possess in their classrooms. From this study, it is clear that students with metacognitive strategies develop better learning skills compared to those without such strategies. Metacognitive strategies can foster something beyond an inclination towards cooperation, such as self-appreciation and self-confidence, with the ability to choose and evaluate one's learning strategies, as well as the value of each strategy and the freedom to continue learning.

Empirical research on reading strategies indicates the complexity of understanding the effective outcomes of metacognitive students, as shown by various literature reviews in different educational contexts. Recent research

has focused on metacognitive strategies and their application (Forbes & Fisher, 2018).

The research states that metacognitive skills play an important role in problem-solving. Students will be better at solving problems if they have metacognitive skills. These metacognitive skills can be trained through reading, especially when identifying the main idea of a passage. During reading, there is a self-regulated learning process that enhances metacognitive skills through information-sharing activities in groups and class discussions (Astriani *et al.*, 2020).

Reading is a complex problem-solving task for both general and specific communication. It is currently established that good reading, even in one's native language, requires successful interaction of various factors related to the reader, the text, and particularly the context. These factors include automaticity and fluency in text processing, vocabulary, background knowledge, motivation for reading, a positive self-concept in reading, and effective use of cognitive and metacognitive reading strategies (Ghaith, 2018).

The problem-solving process begins with the first encounter with a problem and ends when an answer is found through clearly provided information (Olaniyan *et al.*, 2015). Meanwhile, to obtain a solution to a particular problem, the problem solver must employ higher-order thinking skills, including analysis, interpretation, reasoning, prediction, evaluation, and reflection. Aside from being a way to stimulate intellectual curiosity, problem-solving is also believed to help in transferring learned knowledge by providing students with opportunities to draw relationships between what they know and the learning task.

Other researchers have conducted studies investigating the use of metacognitive reading strategies by university teachers. The study revealed that student-teachers used reading strategies differently depending on their levels. Senior and prep-level students used metacognitive reading strategies at higher levels. Based on the three subscales of MARSII, problem-solving reading strategies were commonly used among student-teachers at all levels; however, the difference in the use of strategies across the levels of student-teachers was not statistically significant (Boyras & Altinsoy, 2017). Therefore, the results revealed that while the overall use of strategies among these students was low, supportive reading strategies were more frequently used, and problem-solving strategies were less commonly used (Ganji, 2018).

Supportive reading strategies are ways to maintain reading. Finally, problem-solving strategies, as the name suggests, are ways to overcome obstacles to comprehension (Mohktari & Reichard, 2002). Some studies suggest a correlation between the use of metacognitive reading strategies and reading scores. Therefore, the results of studies conducted on online metacognitive reading strategies, such as Azmuddin *et al.* (2017), are similar to those conducted on printed materials, where problem-solving reading strategies were used more frequently,

followed by global reading strategies, and supportive reading strategies were used less frequently (Yüksel & Yüksel, 2012).

### Level of Research Skills in Reading of College Students

The level of research skills in reading of college students shows an overall result with a standard deviation (SD) of 0.56 and a mean score of 3.94, which received a high descriptive level. Table 4 displays the overall results of the two indicators. In the first indicator related to perception, the standard deviation (SD) is 0.53 and the mean score is 4.12, which received a high descriptive level. Meanwhile, the second indicator related to self-confidence has a standard deviation (SD) of 0.71 and a mean score of 3.77, which also received a high descriptive level.

**Table 4:** Level of Research Skills in Reading of College Students

Indicator	SD	Mean	Descriptive Level
Perception	0.53	4.12	High
Self-Confidence	0.71	3.77	High
Total	0.56	3.94	High

The study's results show that the research skills in reading of college students need to be further developed because they achieved a low descriptive level. This indicates that college students struggle in conducting research in class. Research skills in the college curriculum require additional focus on instruction, but are still taught using pedagogical methods directed by the teacher (Hosein & Rao, 2017). Meanwhile, many writers have proposed different strategies for developing research skills. They focus on faculty mentorship as a way to provide research skills and argue that the quality of the research conducted by students depends on the quality of the mentoring they receive (Feldon, *et al.*, 2015).

Skills that lead students to think critically and solve problems are research skills. Research skills acquired through a series of research activities help students critically analyze a problem, develop and analyze data, ideas, and hypotheses related to the data, and form and test conclusions.

The results, based on students' perspectives, show that the activity was useful for the assimilation of concepts related to educational research in the context of secondary education (research skills). This would be beneficial for improving students' critical thinking (teacher candidates) and their professional future in the context of applied research in the daily activities of secondary school teachers. Moreover, the results show that the activity was useful for the development of the final Master's thesis. The difficult aspects of the activity for them were analyzed.

The results of the study indicated that active learning significantly improved the overall skills of the participants,

as shown by the increase in final exam scores, individual writing skills, and research skills. The research discusses the most and least developed skills, as well as pedagogical implications for teaching writing and research through active learning (Hamdan-Alghamdi *et al.*, 2018). The learning skills in writing in Filipino are carried out through active thinking and artistic ways of expressing a student's emotions and thoughts in their language and cultural background. The proposed study on this skill highlights the relationship between the Filipino language and culture, emphasizing that language is the primary tool used for expressing thoughts and emotions. The study aims to shape students' confidence and skills, cultivating the ability to be critical and creative in writing.

**Significance of the Relationship Between Instruction in Language Writing and Research Skills of College Students**

Table 5 shows the overall result of the relationship between instruction in language writing and research skills of college students, which yielded a p-value of .000, indicating it is below the .05 level of significance. Therefore, the two variables are related. The r-value of 0.448 suggests a strong correlation between instruction in language writing and research skills of college students. Thus, the null hypothesis is rejected in favor of the alternative hypothesis, which states that there is a significant relationship between instruction in language writing and research skills of college students. Furthermore, the results of the study indicate that the two variables are related, with a p-value of .000, which is below .05. The overall r-values are as follows: .288 in narrative text, .347 in self-confidence in narrative text, .376 in teaching how to write an introduction in factual text, .419 in writing an introduction in factual text, and

.297 in teaching typical formal and informal language. As shown in Table 5, all indicators of each variable are related. Therefore, there is a favorable relationship between the two variables.

This study has significant implications for students in fully developing their research skills. According to the study by Hamdan-Alghamdi *et al.* (2018), the results indicated that active learning significantly improved the overall skills of participants, demonstrated by the increase in final exam scores and individual skills in writing, reading, and research. The research discusses both high and low skills, as well as the pedagogical implications for teaching writing and research using active learning. Ehri and Flugman (2018) proved that teacher guidance helps enhance their classroom assessment skills, which can impact student performance.

In a study conducted, attention was given to the variable affecting the research skills of students. The first variable was instruction in writing. The aim of the study was to determine the relationship between instruction in writing and research skills of students. It was found that academic intrinsic motivation has a significant and positive relationship with student engagement. However, based on previous research, the strength of the relationship was expected to be high (Bazerman *et al.*, 2017). Likewise, classroom assessment has an important relationship with student engagement, confirming their theoretical assumption that classroom assessment is a predictor of research skills. The metacognitive strategy in reading also shows a significant relationship with the research skills of students, as emphasized in the study by Wajid and Jami (2020), which supports the conclusion that intensive metacognitive reading enhances students' skills towards research.

**Table 5:** Significance of the Relationship Between Language Writing Instruction and Research Skills of College Students

Writing Instruction	Research Skills		
	Perception	Confidence	Overall
Narrative Text	.348** .000	.193** .000	.288** .000
Self Confidence on Narrative Text	.321** .000	.306** .000	.347** .000
Teaching Introduction Writing to a Factual Text	.410** .000	.284** .000	.376** .000
Be able to write an introduction to a factual text	.384** .000	.371** .000	.419** .000
Teaching the Physicality of Formal and Informal Language	.370** .000	.190** .000	.297** .000
Total	.476** .000	.348** .000	.448** .000

**Significance of the Relationship Between Classroom Assessment and Research Skills of College Students**

The data in Table 6 shows the relationship between classroom assessment and research skills of college

students in Region XI, with an overall r-value of 0.435 and a p-value of 0.000, which is significantly lower than 0.05. This indicates a significant relationship between the two variables. In other words, the null hypothesis is rejected

in favor of the alternative hypothesis, which asserts that there is a significant relationship between classroom assessment and research skills of college students. Each indicator shows a relationship between classroom assessment and research skills, with a p-value of 0.000, which is lower than 0.05, and r-values of 0.387 for

alignment with planned learning, 0.302 for realism, 0.333 for student consultations, 0.370 for clarity, and 0.339 for student capabilities. Based on the results, there is a significant relationship between classroom assessment and research skills of college students.

**Table 6:** The Significant Relationship Between Classroom Assessment and Research Skills of College Students

Classroom Assessment	Research Skills		
	Perception	Self-Confidence	Total
Alignment with Planned Learning	.391**	.316**	.387**
	.000	.000	.000
Realism	.301**	.250**	.302**
	.000	.000	.000
Consultation for Student	.320**	.284**	.333**
	.000	.000	.000
Clarity	.378**	.299**	.370**
	.000	.000	.000
Student Competence	.294**	.315**	.339**
	.000	.000	.000
Total	.422**	.368**	.435**
	.000	.000	.000

The results of the study are supported by a research that states that classroom assessment has a significant relationship with student engagement, confirming their theoretical assumption that classroom assessment is an important predictor of research skills.

**Significant Relationship Between Metacognitive Reading Strategies and Research Skills of College Students**

The results shown in Table 7 indicate a significant relationship between metacognitive reading strategies and research skills of college students, with a total r-value of .391 and a p-value of .000, which is lower than the .05 significance level, suggesting a meaningful relationship established in this study. Therefore, the hypothesis was rejected and the alternative hypothesis

was accepted, indicating a significant relationship between metacognitive reading strategies and the research skills of college students.

Each indicator also shows a relationship between metacognitive reading strategies and the research skills of college students, with a p-value of .000, which is lower than .05. The r-values for the indicators are .212 for problem-solving strategies, .349 for reading support strategies, and .434 for global reading strategies. This suggests that metacognitive reading strategies are positively related to the research skills of college students. Metacognitive reading strategies show a strong connection to research skills because, as emphasized in the study by Wajid and Jami (2020), it supports the conclusion that emphasizing intensive metacognitive reading can enhance students' skills towards research.

**Table 7:** The Significant Relationship Between Metacognitive Reading Strategies and Research Skills of College Students

Metacognitive Reading Strategies	Research Skills		
	Perception	Self-Confidence	Total
Problem-Solving Strategies	.268**	.133**	.212**
	.000	.008	.000
Support Reading Strategies	.376**	.268**	.349**
	.000	.000	.000
Global Reading Strategies	.440**	.354**	.434**
	.000	.000	.000
Total	.424**	.298**	.391**
	.000	.000	.000

**Significant Influence of Writing Instruction, Classroom Assessment, and Metacognitive Strategies on the Research Skills of College Students**

The results presented in Table 6 show the significant influence of writing instruction, classroom assessment, and metacognitive strategies on the research skills of

college students, with a calculated F-value of 46.534, an R-value of 0.511, an adjusted R<sup>2</sup> value of 0.261, and a p-value of 0.000, which is less than 0.05, indicating the highest level of significance. Based on the overall results, each variable agrees with rejecting the null hypothesis and supports the alternative hypothesis.

**Table 8:** Overall Influence of Writing Instruction, Classroom Assessment, and Metacognitive Strategies on the Research Skills of College Students

Research Skills		B	β	t	Sig.
Constant		.798		2.814	.005
Writing Instruction		.293	.246	4.381	.000
Classroom Assessment		.235	.204	3.571	.000
Research Skills		.223	.159	2.996	.003
R	.511				
R2	.261				
ΔR	.255				
F	46.534				
q	0.000				

**Differences in Research Skills Linked to Writing Instruction, Classroom Assessment, and Metacognitive Strategies**

This means that 73.9% of the variation in teaching ability is linked to other variables not included in this study. Additionally, the table presents three exogenous variables: writing instruction, which obtained (Beta = .293, P-value = .000); classroom assessment, which obtained (Beta = .235, P-value = .000); and metacognitive strategies, which obtained (Beta = .223, P-value = .003).

The results of the collected data reflect that writing instruction has standardized and unstandardized coefficients of .293 and .246, a t-value of 4.381, and a p-value of .000 (Significant); classroom assessment has standardized and unstandardized coefficients of .235 and .204, a t-value of 3.571, and a p-value of .000 (Significant); and metacognitive strategies have standardized and unstandardized coefficients of .223 and .159, a t-value of 2.996, and a p-value of .003 (Significant).

The study confirmed that research is essential for the economic development of any country (Garg 2-3). Furthermore, it states that research leads to inventions, innovations, and the creation of new technologies and products that help improve and solve various political, socio-economic, cultural, technological, and environmental issues. However, research requires human resources to gain skills and knowledge (Frantzen, 2000). It has been proven that colleges play a significant role in performance and the dissemination of knowledge, providing the necessary research skills to students and preparing them for social knowledge (Shanahan, 2017). It has also been emphasized that research skills are described as identifying the problem, recognizing the appropriate sources of information, gathering quality sources, analyzing the quality and relevance of information,

and using information effectively to solve the problem (Badke, 2011).

**Summary of Goodness of Fit Measures of the Three Generated Models**

This section examines the relationships between the variables in the study. Three models were developed to determine the most appropriate model for the research skills of college students. The models were evaluated against the given fit indices and served as the basis for accepting or rejecting the model.

The developed Structural Model 1 shows the direct causal relationship of the exogenous variables: writing instruction, classroom assessment, and metacognitive strategies. The framework of this model, shown in Figure 1 on page 109 of Appendix A, needs modification to address the requirements of goodness-of-fit measures. In relation to this, Model 1 is deemed inappropriate because the p-value = .000, RMSEA = .125, and p-close = .000, with all index values failing to meet the required criteria. Meanwhile, the developed Structural Model 2, presented on page 110 of Appendix A, also shows the direct causal relationship of the exogenous variables: writing instruction, classroom assessment, and metacognitive strategies. This model is also unsuitable because the p-value = .000 and RMSEA = .075 with p-close = .000, indicating that all index values do not meet the required standards.

Finally, the developed Structural Model 3, which illustrates the direct causal relationship of the exogenous variables: writing instruction, classroom assessment, and metacognitive strategies, has been identified as the most appropriate model. This model is highly acceptable, as presented in Table 9. The Chi-Square, divided by degrees of freedom, is 1.390 with a p-value of .054, indicating

the most appropriate model. This is supported by the Root Mean Square Error of Approximation (RMSEA) index of .031, which is lower than the 0.05 significance level, with the related p-close of .857. Furthermore, other

indices such as the Normed Fit Index, Tucker-Lewis Index, and Comparative Fit also strongly indicate the most appropriate model, as all measures meet the criteria.

**Table 9:** Summary of Goodness of Fit Measures of the Three Generated Models

Research Skills								
	P-value (>0.05)	CMIN/DF(0<value<2)	GFI (>0.95)	CFI (>0.95)	NFI (>0.95)	TLI (>0.95)	RMSEA (<0.05)	P-close (>0.05)
1	.000	7.190	.825	.808	.785	.769	.125	.000
2	.000	3.238	.915	.933	.907	.916	.075	.000
3	.054	1.390	.979	.993	.976	.988	.031	.857

Legend: CMIN/DF – Chi Square/Degrees of Freedom  
 GFI – Goodness of Fit Index  
 RMSEA – Root Mean Square of Error Approximation

NFI – Normed Fit Index  
 TLI - Tucker-Lewis Index  
 CFI – Comparative Fit Index

**Best Fit Model of Professional Learning Communities**

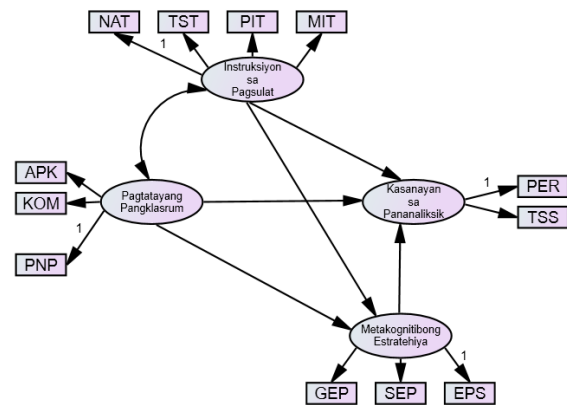
This section highlights the analysis of the relationships between writing instruction, classroom assessment, and metacognitive reading strategies and their influence on research skills of college students. Three models were tested to achieve the most appropriate model for the students’ research skills.

Hypothesized Structural Model 1 is presented in Table 1, showing the direct relationship of exogenous variables: writing instruction, classroom assessment, and metacognitive strategies and their causal relationship with the endogenous variable, research skills. All indices reached acceptable levels as shown in the appendix. Thus, this model was found to be weak and inappropriate.

Hypothesized Structural Model 2 in Table 2 shows the relationship between exogenous variables: writing instruction, classroom assessment, and metacognitive strategies and their causal relationship with research skills. The direct effects of the predictors on the dependent variable (research skills) are presented in the appendix. This model was found to be strong, as all indices met the acceptable threshold.

Hypothesized Structural Model 3 was found to represent the most appropriate model based on the data, indicated by the CMIN/DF = 1.390, p-value = .054, RMSEA = .031, p-close = 0.857, and indices such as NFI (0.976), TLI (0.988), CFI (0.993), and GFI (0.979). All indices, including the corresponding values, were above 0.95 or met the requirements for goodness of fit measures. Since Model 3 was identified as the most appropriate model for research skills, it does not warrant further testing of any other models. Thus, the hypothesis was rejected.

In determining the most appropriate model, all indices must be within acceptable limits. The Chi-squares/degrees of freedom value should be less than 5, with a corresponding p-value greater than 0.05. The root mean square approximation value should be less than 0.05, and the corresponding p-close should be greater than 0.05. Other indices such as the normed fit index, Tucker Lewis index, comparative fit index, and goodness of fit index should all be greater than 0.95.



**Figure 2:** Most Suitable Model in Research Skills

**Legend**

- NAT- Narrative Text
- TST- Self-Confidence
- PIT- Writing an Introduction to a Text.
- MIT- Informative Text
- KOM-Student’s consultation
- PNP- Planning for learning
- GEP- Global Reading Strategies
- SEP- Support Reading Strategies
- EPS-Strategy on Problem Solving
- PER- Perception
- TSS- Self-Confidence

**CONCLUSION**

In summary, the study reveals significant insights into the writing instruction, classroom assessment, and metacognitive reading strategies employed with college students. The high descriptive level for writing instruction underscores the importance of narrative text, teaching writing introductions for factual texts, and the use of formal and informal language. Similarly, classroom language evaluation is perceived positively, particularly regarding realism and alignment with planned learning. Metacognitive reading strategies, encompassing problem-solving, supportive, and global strategies, are also highly rated. These findings suggest that while there

are strengths in current educational practices, there's a need for continuous improvement and attention to these key areas to enhance students' overall learning experience and academic performance.

A structural model hypothesis reinforced the study, revealing high levels of writing instruction, assessment, metacognitive strategies, and research skills among students in Region XI. These findings align with Social Constructivism and the Control-Value theory, which highlight the importance of interaction, collaboration, and guided instruction in learning. Constructivism, advocated by Piaget and Vygotsky, suggests that students actively construct knowledge through experiences. Piaget's Cognitive Constructivism focuses on discovery-based learning, while Vygotsky emphasizes the role of social interaction and scaffolding. In a constructivist classroom, teachers act as facilitators, planning and guiding instruction, while students engage in active learning. This approach fosters critical thinking, problem-solving, and deeper comprehension, ultimately contributing to improved educational outcomes.

### Recommendations

Based on the results of the study, the researcher has suggested the following recommendations for students: It was shown in the variable of writing instruction in the language of college students that the indicator with the lowest descriptive level was self-confidence in narrative texts. This suggests that students' self-confidence in narrative texts is low, highlighting the importance of focusing on this aspect to help students develop their self-confidence. Through exercises that focus on building students' self-confidence, this can help enhance their trust in their own abilities.

In the variable of classroom assessment of language by college students, the result showed that the indicator related to clarity was the one with the lowest descriptive level. This implies that students struggle with clarity in the classroom assessments given by teachers. In response to this issue, it is essential for teachers to continue attending various workshops related to the use of appropriate assessment strategies to accurately evaluate students at the correct level.

Meanwhile, in the variable of metacognitive reading strategies of college students, the result revealed that the indicator regarding global reading strategies had the lowest descriptive level. This means that students' skills in using global reading strategies are low. Through reading interventions for students, this can help improve their reading skills, particularly in utilizing standard global reading strategies.

Furthermore, in the independent variable of research skills in reading among college students, the indicator that had the lowest descriptive level was self-confidence. This shows that students' self-confidence in their research skills is low. This indicates a lack of capability and skills in research. In response to this issue, schools should organize research conferences to give students the opportunity to

attend and gain insights into how research is conducted. Additionally, it would expand students' knowledge of research, helping them enhance their research skills.

The results of the study show a significant relationship between the following variables: writing instruction, classroom assessment, and metacognitive strategies in research skills. Therefore, the null hypothesis was rejected. Among the three models examined, Model 3 had consistent indices and indicated the most suitable data. Hence, it was recognized as the most appropriate model. The goodness of fit result for Model 3 is highly acceptable as all indices met the established criteria against the acquired values of the most appropriate model.

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