

## Research Article

# The Development of Metacognitive Models to Support Students' Autonomous Learning: Lessons from Indonesian Primary Schools

Dyah Werdiningsih <sup>1</sup>, Anwar Hammad Al-Rashidi <sup>2</sup>, and Mochamad Imron Azami <sup>3</sup>

<sup>1</sup>Department of Indonesian Language Education, Faculty of Teacher Training and Education, Universitas Islam Malang, Malang, Indonesia

<sup>2</sup>College of Education, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia

<sup>3</sup>Department of English Education, Faculty of Teacher Training and Education, Universitas Islam Malang, Malang, Indonesia

Correspondence should be addressed to Dyah Werdiningsih; [dyah.werdiningsih@unisma.ac.id](mailto:dyah.werdiningsih@unisma.ac.id)

Received 28 June 2022; Revised 20 July 2022; Accepted 22 July 2022; Published 23 August 2022

Academic Editor: Mehdi Nasri

Copyright © 2022 Dyah Werdiningsih et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The present study was designed to develop an Indonesian language learning module based on metacognitive strategies to support student learning autonomy. The development of this module is based on Oxford's (1990) strategy development model. Data were generated through quantitative and qualitative approaches. The analysis showcases that (1) module requirements were determined based on information of student needs, of whom 53% stated to agree and 31% strongly agree in case of the development of an Indonesian language learning module based on the metacognitive strategy; (2) the development of the module was conducted by integrating metacognitive strategy training and implementation in learning, evaluations, and revisions; (3) module accuracy was shown by the validation results from language experts (85%), design experts (93%), media experts (86%), and practitioners (77%), which is stated as valid; and (4) the module effectiveness was based on the results of SPSS 20 analysis: if  $t$ -value is  $-7.267$ , smaller than  $t$ -table of  $-2.045$ , it means that there is a significant difference between pretest and posttest scores. This finding unpacks that there is a difference between student learning outcomes before and after the implementation of learning with Indonesian language learning modules based on metacognitive strategies. Implications from these findings are discussed.

## 1. Introduction

In language learning, cognitive development is considered a determinant of the intellectual intelligence of a person. In its development, the important thing that needs to be considered is how to manage these cognitive abilities in responding to situations or problems. The cognitive aspects cannot run separately on their own but need to be controlled. If someone uses their cognitive abilities, they need the ability to determine and regulate what cognitive activities are to be performed. Therefore, a person must have an awareness of the ability to think and

be able to regulate it. Experts call this metacognitive ability. The higher-order thinking ability of language learners may be strengthened by empowering meta-cognitive abilities.

Metacognitive skills can be developed through cooperative learning [1]. Cooperative learning communication occurs among group members [2–8]. An authentic learning model places a strong emphasis on the use of authentic inquiry-based assignments that require students to engage in higher-order thinking skill (HOTS), complex tasks that require students to solve within a given duration, and authentic assessments [9–17].

Significant metacognitive development can proceed inside and outside the classroom. The implementation of the metacognitive strategy integration model in learning the Indonesian language has the potential to increase the metacognitive skills of the learners. If learners have possessed metacognition, they will be able to use the metacognitive strategy. Learners skilled in using the metacognitive strategy will be able to become independent learners more quickly. Furthermore, students who use metacognitive skills have a better performance than students who do not use metacognitive skills or have poor metacognitive skills [18].

Metacognitive strategies in learning have been conducted by some researchers such as [19] who reported the results of research on compared metacognitive awareness, as measured by self-ratings of reading, writing, speaking, and listening skills, among college students with diverse language experience backgrounds. Previous research by [20] focused on a small-scale investigation that examined the effect of metacognitive education on the comprehension of listeners. A previous study [21] reported the research findings on the effect of embedded metacognitive instructions on student learning outcomes. Similarly, previous research by [22] revealed that metacognitive strategy use was also found to significantly increase as the test date approached underscoring the goal-oriented nature of situated learning behaviors.

Numerous previous studies have examined all forms of student learning techniques, but none of them have shown the metacognitive strategies that have the ability to successfully empower students' strategic competencies, hence influencing the quality of the learning process and outcomes. Students can attain learning success if they are able to deliberately manage their cognitive processes on an ongoing basis and influence their metacognitive abilities. Widespread efforts are made to enhance the cognitive, emotional, and psychomotor capabilities of students. However, the issue of learning that enhances metacognitive skills, particularly in the context of learning Indonesian, has not been publicly disclosed.

The present study is based on the previous studies carried out by Werdiningsih [23–27] and includes (1) research on the creative construction process of children's language learners in mastering pragmatic competence revealed the existence of a creative construction model/theory of pragmatic competence acquisition that can be observed in children's language learners' use of learning strategies [23]; (2) research on the acculturation process in acquiring pragmatic competence of children's learners, which provides an overview of the use of children's speech forms that represent their pragmatic competence acquired through the process of acculturating the learner to the target culture and language [24]; (3) research on learning strategies that emphasize mastering the pragmatic competence of Indonesian language for young learners, which was conducted in the setting of natural language use and the context of the learner's bilingualism, and it was found that there was a development of learning strategies used by children's

learners beginning at the ages of 2, 3, 4, and 5 years old [25]; (4) research on communication strategies of child speakers in interacting with various speech partners in the diglossic community environment, and obtained descriptions and explanations of the characteristics of various types, causal factors, and functions of the use of communication strategies by child speakers, as well as an overview of the development of communication strategies and developments; (5) the pragmatism acquired by child speakers prior to entering the school language learning process [26], and research on the profile of language learning strategies for low-grade elementary school students at different levels, as well as the effect of using learning strategies on the achievement of Indonesian language proficiency, particularly with reading and writing skills [27]. This finding is related to [28] and [29, 30], which has strong implications for learning strategies training. Training that is focused on one type of learning strategy will have a side effect of increasing the intensity of using other learning strategies. Furthermore, when learners have reached the level of using learning strategies effectively, they will become autonomous learners who are responsible for their own learning activities [31–35].

In relation to the significant efforts of constructing students' autonomous learning and the Indonesian government's curriculum targets, the presence of the Indonesian language learning module based on the metacognitive strategy for primary school students is expected to contribute to students' learning progress. Anchored by this evidence, the present study focused on the development of an Indonesian language learning module based on the metacognitive strategy to support students' autonomous learning.

## 2. Problem Statement

This study investigates the needs of students and teachers, the development process, and the effectiveness of the Indonesian learning module based on the metacognitive strategy. This study is guided by the following questions:

- (1) What are the needs of students and teachers of an Indonesian language learning module based on the metacognitive strategy to support the students' autonomous learning?
- (2) How is the development process of an Indonesian language learning module based on the metacognitive strategy to support students' autonomous learning?
- (3) How is the effectiveness of an Indonesian language learning module based on the metacognitive strategy to support students' autonomous learning?

## 3. The Role of Metacognitive Strategies to Support Students' Autonomous Learning

Metacognitive strategies play a crucial role in fostering the independence of language learners. To be conscious of what

has been, is being, and will be learned and accomplished, it is necessary to experience the process of self-activity in the form of empowering thinking skills and identifying ways of thinking and how to think. This experience will provide insight into the context of learning, including what has been, is being, and will be learned as well as how to manage the independent study. This involves thinking about the process of thinking, or metacognition [36, 37]. Grade by grade, students demonstrate an increasing proportion of metacognitive knowledge [38]. Metacognition enables students to plan, monitor, and evaluate their learning processes and products; therefore, it plays a crucial role in self-regulated learning [39].

Metacognition is the awareness and understanding of cognitive processes. By using cognitive processes to reflect on one's cognitive processes, metacognition can generate interest. Metacognition is crucial because knowledge of cognitive processes guides students in the development and selection of strategies to enhance their performance [40]. Thus, metacognition is a form of self-awareness that allows for optimal control of actions [38].

The two main subcomponents of metacognition are knowledge of cognition and regulation of cognition. There are three components to the knowledge of cognition: declarative knowledge, procedural knowledge, and conditional knowledge. Planning (planning), monitoring (monitoring), and evaluation are elements of regulated cognition (evaluation). Knowledge of cognition and cognition regulation can work together to form self-regulated learners. Consequently, metacognition is a characteristic of self-regulated learning, and regulation of cognition is a metacognitive strategy [41, 42].

As experienced, the implementation of metacognitive strategies in language skill acquisition, namely achieving communication competence through thinking steps and activities in planning, monitoring, and evaluating, will instill self-efficacy. Moreover, if the solution to effective communication can be determined using this method, this will result in different behavior than in the past. The distinction between these behaviors is the development of metacognitive skills (planning, monitoring, and evaluating). This experience will shape how one directs and instructs oneself to transform cognitive abilities (metacognitive) into abilities [43].

Self-regulated learning is achieved when an individual actively engages in enhancing their mental abilities (metacognitive), emotions, and goal-directed behavior. In general, students' self-regulated learning can be characterized by their participation in terms of metacognition, motivation, and behavior during the learning process [44]. Some researchers define self-regulated learning as an internal mechanism involving conscious and intentional behavior to self-regulate learning by incorporating metacognitive skills, motivation, and active behavior [45].

Communication competence can be achieved through (1) understanding the problem (understand the problem), (2) planning problem solving (developing a plan), (3) solving problems according to plan (carrying out the plan), and (4)

reexamining the results obtained, or through (1) reading and thinking, (2) exploration and planning, (3) selecting a strategy, and (4) seeking feedback (seek feedback) (reflect and extend). The steps of this learning process consist of metacognitive strategies for planning (planning), monitoring (monitoring), and evaluating (evaluation). Each individual's experience implementing metacognitive strategies influences their daily actions. This type of behavior is the ability to control one's thinking, motivation, and actions to achieve one's goals. Self-regulation in metacognitive strategies is therefore self-regulated learning. Therefore, language acquisition through metacognitive strategies can foster learning autonomy [46].

According to the Law of the Republic of Indonesia Number 20 of 2003 on the National Education System, the purpose of national education is to develop the potential of students to become citizens who believe in and fear God Almighty, have a noble character, and are healthy, knowledgeable, capable, creative, independent, democratized, and accountable. Based on this objective, there are educational objectives to shape students into autonomous individuals. Independent refers to an individual's initiative and initiative in learning. Consequently, learning the Indonesian language should be pursued to realize student activities personally through thought and practice. This demonstrates that language learning activities can be a vehicle for achieving national education goals, namely the development of autonomous individuals.

According to this description, when students receive a learning experience that integrates metacognitive strategies, their learning independence will be developed, an important form of attitude or character possessed by every Indonesian student for it to become a part of the nation by the objectives of national education.

## 4. Methodology

*4.1. Research Design.* This research used the training strategy development model of Oxford [47, 48]. Based on this development model, the procedure of metacognitive strategy development for students is conducted through eight steps of (1) determining learner needs, (2) selecting the metacognitive strategy, (3) integrating training in the materials, (4) identifying methods to motivate learners, (5) compiling learning materials, (6) implementing the training, (7) evaluating training implementation, and (8) improving the training strategy. This model is expected to help learners understand the textual structure and content of the text as well as to help solve problems in the text [49].

*4.2. Data Collection.* Research data consisted of narratives and numerical data obtained from eight Indonesian language teachers from four primary schools in the City of Malang, East Java Province, Indonesia. Interviews and a survey were used to find out information on product needs and product testing from material and media experts, teachers, and students.

**4.3. Data Analysis.** Data for the study were analyzed using a descriptive percentage analysis. To conclude, the following data criteria were established (see Table 1). Data from the product effectiveness testing were analyzed using the SPSS analysis with the paired sample *t*-test.

## 5. Findings

**5.1. Results of Need Analysis.** The study details the needs analysis of (1) teacher, (2) student, and (3) students' learning motivation. First, surveys for identifying teacher needs were filled out by the recruited Indonesian language teachers. Based on the identification of the needs of Indonesian language teachers, it was found that teachers (1) have not been satisfied with how they have delivered materials, (2) agree to the development of the Indonesian language learning module based on the metacognitive strategy, (3) agree that the Indonesian language learning module should be interactive and enable the student in learning, and (4) agree that Indonesian language learning should be enacted in the form of an Indonesian language learning module based on the metacognitive strategy to support the learning autonomy of students. This finding corresponds to the previous research by [51], explaining that when the teacher has adjusted to the learning styles of each student, learning will be more easily absorbed and learning outcomes will be maximized. The success of students in capturing information or knowledge delivered by the teacher is determined by the readiness of the brain to capture the information or knowledge. If the brain is not ready, the learning process will never occur. On the other hand, an analysis of teacher needs is conducted in accordance with the research of [52], revealing that the main goal of education is to store information from the classroom and enable the students to acquire the skills, abilities, and strategies which they will use throughout their lives rather than to start as a sponge of knowledge initiated by their teachers.

Second, based on the identification of student needs, it was found that (1) 56.25% of students agree that it is more pleasant to learn the Indonesian language with the module because it is understandable; (2) 43.75% of students agree that during the learning process, the material should give them the freedom to be creative; (3) 53.125% of students strongly agree that Indonesian language learning module is being presented in the form of metacognitive strategy-based module so that students can understand the aims of language learning and plan, assess, and evaluate their own learning outcomes; (4) 71.875% of students strongly agree that the Indonesian language learning module should contain a special section to understand the material in-depth; and (5) 81% of students agree that Indonesian language learning should be developed based on the metacognitive strategy. (6) 71.875% of students agree that there should be language practice in the Indonesian language learning module so that students can identify their learning progress. According to [51], in the learning process, learning styles and the delivery method of material by

TABLE 1: Product scoring indicator.

Category	Percentage range	Remark	Meaning
A	81%–100%	Very feasible	Utilized
B	61%–80%	Feasible	Utilized
C	41%–60%	Moderately feasible	Revised
D	<40%	Not feasible	Replaced

Source: Riduwan [50] (2010: 70).

the teacher are adjusted to what is desired by the students since it will have a good impact on student learning outcomes. Learning that uses a neuroscience perspective involves the formation and strengthening of connections and neural networks, which strengthens the relationship between the characteristics of learning styles with the improvement of students' metacognition skills.

Third, an analysis was performed to reveal students' learning motivation. Figure 1 showcases the analysis result.

Based on the results of the learning motivation analysis of students (see Figure 1), it can be concluded that students possess high motivation in learning and completing exercises in an Indonesian language learning module based on the metacognitive strategy, because by using it, students can understand the purpose and benefits and can plan out, implement, and evaluate their learning outcomes. This is in line with the previous research by [53] who have developed a multitiered education package designed to improve learner motivation, engagement, and control and this is useful for student metacognition and executive control.

**5.2. Module Development.** Based on the development procedure, the Indonesian language learning module based on the metacognitive strategy is developed through the following eight stages as follows.

(i) *Determining the Needs of Middle Schools*

This step was explained in the stage of needs analysis. Based on the analysis results, students can achieve the targeted competence and possess high motivation in learning and completing exercises in the Indonesian language learning module based on the metacognitive strategy if they understand the purpose and benefits and can plan out, implement, and evaluate their learning outcomes. Previous research by [17] suggests a reframing of students' need assessment to promote alignment and authenticity. In other words, learning effectiveness can be achieved if students utilize the metacognition strategy in learning the Indonesian language. Metacognition is one type of high-order thinking. To distinguish metacognitive thinking from other kinds of thinking, it is necessary to consider the source of thought. Metacognitive thinking is not something that suddenly comes from outside, but is one's mental representation, which includes what one knows about internal

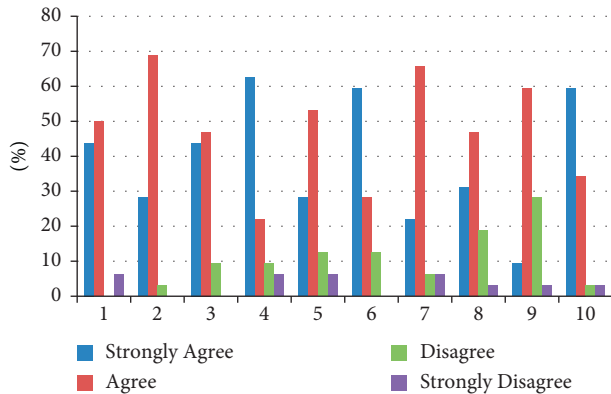


FIGURE 1: The analysis of students' learning motivation

representation, how the description works, and how one feels the representation [54].

(ii) *Selecting the Metacognitive Strategy*

In this step, the appropriate metacognitive strategy is selected according to the characteristics and needs of the learner. Some of the actions conducted for this step are (a) choosing several metacognitive strategies that are appropriate, support each other, and are useful for all learners, (b) choosing metacognitive strategies that were generally applied for all learners and can be applied for all language tasks/exercises and in various communicative situations, (c) choosing a very easy metacognitive strategy and a difficult strategy for learners, and (d) including other strategies such as memory, compensation, affective, metacognitive, and social strategies or even others that can potentially support the development of metacognition of learners. Metacognitive skill is one important role in successful learning [51, 52, 55–62], so this step is an essential step in determining the metacognitive strategy that is suitable for students regarding the success in achieving learning objectives.

(iii) *Integration of Training*

In this step, the technique of integrating the training of metacognitive development in learning was carried out. There have been a large number of studies in the field of language learning strategies in the last twenty years (e.g., [63–65]), but the research was focused on students' metacognitive development. However, metacognitive development not only focuses on students but also on the form of integration of training. However, there is no one best method to conduct the strategy training. Previous research by [66] is related to first language learning but is also applicable to second language learning, by explicitly modeling and explaining the benefits of using a particular strategy by targeting isolated strategies, extensively implementing strategies, and making strategies a new learning context. However, the integration of training in this result can be done by (a) integrating

metacognitive training with tasks, purposes, and materials used in the metacognitive training program, (b) determining the content of independent metacognitive training that is relatively objective, (c) determining the metacognitive learning strategy that can be used in a significant context for learners, (d) guiding learners on how learners can transfer those metacognitive strategies for new tasks in the achievement of other competencies, and (e) providing training of other strategies that are not related to the current lesson at that time.

(iv) *Identifying Motivation*

In this step, encouragement was given to learners in using various metacognitive strategies in their learning process. This phase was done by (1) giving the explanation that the accuracy of the use of metacognitive strategies will facilitate the learners in achieving the targeted competence, (2) providing appreciation in the form of a scoring result related to the appropriate use of metacognitive strategies, and (3) providing motivation to choose the metacognitive strategies which they will learn and then use for language practices tasks [67].

(v) *Composition of Materials*

In this step, the preparation of training materials and activities must be conducted by learners and teachers in the learning process. Training materials were arranged in an integrated manner in the learning-teaching process in the classroom by cooperative learning. Based on the research by [4], students enrolled in the cooperative learning format reported getting higher learning scores. Materials for metacognitive training of learner and teacher activities can be packaged in a handout that contains when and how to use metacognitive strategies that become the training focus. For long-term training, the handout can be used by learners at school or home. Previous research by [34] suggests that a strategy must (1) involve choice, (2) be complex, (3) give knowledge about the approach and advantage from training, and (4) expand the effectiveness of learning new vocabulary and vocabulary use.

(vii) *Implementation of Training*

In this step, the implementation of metacognitive training in learning was carried out according to the targeted competencies by implementing cooperative learning. [4] Previous research showcases that cooperative learning course designs allow students to practice and develop transferable skills. Implementation of metacognitive training was based on the learning tools that have been previously prepared, which are the syllabus and lesson plans that integrate training on metacognitive strategies. The appropriateness of determining metacognitive strategies with the targeted competence and the accuracy of the

training procedure had been tested by expert assessment, learner assessment, and teaching assessment as the targeted users.

(viii) *Evaluation*

In this step, evaluation is carried out on the implementation of metacognitive strategy training. This activity was supported by filling out the evaluation format, which contains evaluations of self-planning, self-observation, and self-evaluation of learners in learning the Indonesian language, which was equipped with learning journals, worksheets, learning awareness sheets, and learning activities. The learning tools provided and developed in this research consisted of a syllabus, lesson plans, worksheets, Indonesian language teaching materials, and learning journals.

(ix) *Revision*

From the results of the evaluation of the strategy, it was found which strategies are considered effective, efficient, and attractive to learners. In line with these steps, these modules are expected to be able to help students learn more easily, achieve the optimal basic competence, and become independent learners.

5.3. *The Effectiveness of the Module.* In this step, the researchers divided two steps to assess the effectiveness of the module through validation of the module and the effectiveness validation by using the SPSS 16.0 program. The validation of experts was done in several ways such as validation of design and media experts and practitioners. On the other hand, students' responses and teachers' responses were also used as considerations to identify the effectiveness of the module. The following is the validation experts' processes of the module:

(i) *Data of Validation Results of Design and Media Experts*

From the results of data validation by design and media experts, it was found that the module is appropriate to student development, unity of ideas, the feasibility of presentation technique, the feasibility of presentation completeness, interest and ease in understanding the textbook, feasibility of teaching presentation, attractiveness in layout, and appropriateness in letter placement. From the data of validation results by design experts it was found that (1) the module was appropriate to the abilities of Grade VIII students, so that the module can be easily understood, and was appropriate to the social and emotional development of Grade VIII students. (2) The developed module reflected a unity of complete and appropriate materials, so that no exercises are separated from the overall materials, and the textbook entirely reflected the interrelation of contents, thus being easily followed by Grade VIII students. (3) The systematics of presentation in each submaterial

was appropriate and consistently organized, and each exercise was very appropriate and balanced in composition. (4) The materials presented by placing the student as the main learning subject were very appropriate, in particular for motivating students. (5) The materials appropriately organized students to learn more actively. (6) The materials were presented with variation, thus in the learning process it can attract the attention of students. (7) The materials were provided with sufficient introductions that contain learning goals, the subject matter, and other items considered important to be informed to students. (8) The materials contained clear instructions, making it easier for students to use them. (9) The materials were supplemented with sufficient and appropriate contents and overviews. (10) The materials were equipped with sufficient exercises. Based on the validator's assessment of the design and media experts, the percentage of validity assessment of the Indonesian language learning module based on the metacognitive strategy is 93%. This shows that the module is valid and can be implemented.

On the other hand, from the results of validation analysis by the media experts, it was found that (1) the module was interesting, (2) the ease of understanding instructions was good, (3) the attractiveness and appropriateness of materials with learning goals were sufficient, (4) the presentation of figures, tables, or illustrations could enable students to understand the material explanations well, (5) the language simplicity was good, (6) the systematic coherence of the writing and the variety of materials developed was good, (7) the development of placing the student as the learning subject was good, (8) the completeness of components of the textbook was good, (9) the color combination was appropriate, (10) the sizes and types of typefaces for a textbook were very appropriate, and (11) the placement of illustrations or pictures to ease understanding of material and the appearance was very adequate. Based on the assessment of the design and media expert validators, the percentage of validity evaluation of the Indonesian language learning module based on the metacognitive strategy is 93%. This shows that the module is valid and can be implemented.

The process of validation by experts in terms of design and media is the essential part of the research to assess whether the module is valid and reliable. Furthermore, the validation process also helps the researcher to acknowledge the shape of the design. As stated by [68], the results of the validation process provide significant scientific insight to help shape the design.

5.4. *Validation and Student-Teacher Responses of the Developed Module*

(i) *Validation Results of Practitioners*

From the results of validation by expert practitioners, it was found that (1) the teaching materials

were suitable to learning identity, (2) the materials were presented with correct concepts and theories, (3) the animations and pictures were relevant to the learning material, (4) the exercises were appropriate to the materials, (5) the attractiveness of color combinations and the appearance of the teaching materials was good, (6) the attractiveness in image visualization was good, (7) the selected and used sizes and types of letters were appropriate, (8) the sentences were clearly structured, (9) the language used was suitable to the abilities of students, (10) the ability of the teaching materials to help students to understand textual materials of biographical stories was appropriate, (11) the ability of the teaching materials to aid students in learning independently was appropriate, and (12) the ability of the teaching materials to increase the learning motivation of students was appropriate. Based on the assessment analysis of the 4 Indonesian language middle school teachers in the City of Malang, the evaluation percentage of the module being developed is 77%. This shows that the teaching materials are valid and can be implemented. Besides, the use of practitioner as a validator of the module was as an indicator to the readiness of the module used in this research. According to [68], a practitioner is the ideal agent for mediating between theory and practice. So, the role of practitioners is vital as a bridge to assess the module in a theoretical and practical way.

(ii) *Results of Student Responses*

Student assessment was carried out by implementing the module in real classroom learning. Based on the results of this implementation, it was found that students were able to use the module well. This can be seen in the achievement of basic student competence, as in the following table (Table 2).

After the implementation of the module, students were asked to fill out a survey to provide responses to the conducted learning. Aspects evaluated in the student response surveys covered appearance, language, and content. Data of the results of student response surveys can be seen in the following.

From the results of data analysis of student responses, it was known that for students of Grade VII middle schools in the City of Malang, (1) 81% agreed that the Indonesian language learning module was very practical and easy to use for learning, (2) 83% agreed that the Indonesian language learning module increased motivation in learning the Indonesian language and in particular textual materials, (3) 67% strongly agreed that the Indonesian language learning module clearly informed learning goals, (4) 67% agreed that the usage of instructions in the Indonesian language learning module was very helpful in using the book, (5) 100% strongly

TABLE 2: Results of student learning after module implementation.

No.	Basic competence	Student name	Score
1.	Understanding spoken and written texts well	AYM	75
		AAS	70
		INA	95
		M	90
		STM	73
		WF	95
Average score		<b>83</b>	
2.	Understanding the meaning of spoken and written texts well	AYM	67
		AAS	67
		INS	100
		M	100
		STM	100
		WF	100
Average score		<b>89</b>	

agreed that the journal presented in the Indonesian language learning module helps to find out how far learning was achieved, (6) 50% strongly agreed that the evaluation in the Indonesian language learning module can help in assessing learning development, (7) 83% strongly agreed that the texts contained in the Indonesian language learning module increased students' knowledge, (8a) 83% agreed that the material contents of the Indonesian language learning module helped students to understand texts, (8b) 67% strongly agreed that the material contents of the Indonesian language learning module helped to distinguish texts, (8c) 83% agreed that the material contents of the Indonesian language learning module helped to classify texts, (8d) 67% strongly agreed that the material contents of the Indonesian language learning module helped to identify texts, (8e) 67% agreed that the material contents of the Indonesian language learning module helped to grasp the meaning of texts, (8f) 50% strongly agreed that the material contents of the Indonesian language learning module helped to compose texts, (8g) 50% strongly agreed that the material contents of the Indonesian language learning module helped to examine and revise texts, (8h) 83% agreed that the material contents of the Indonesian language learning module helped to summarize texts, (9a) 67% strongly agreed that the test of understanding of the Indonesian language learning module helped to understand texts, (9b) 67% strongly agreed that the test of understanding of the Indonesian language learning module helped to differentiate texts, (9c) 67% agreed that the test of understanding of the Indonesian language learning module helped to classify texts, (9d) 83% agreed that the test of understanding of the Indonesian language learning module helped to identify texts, (9e)

50% strongly agreed that the test of understanding of the Indonesian language learning module helped to grasp the meaning of texts, (9f) 50% strongly agreed that the test of understanding of the Indonesian language learning module helped to compose texts, (9g) 83% agreed that the test of understanding of the Indonesian language learning module helped to examine and revise texts, and (9h) 83% agreed that the test of understanding of the Indonesian language learning module helped to summarize texts.

The results of the student response on surveys provide an overview student response to the developed teaching materials. In general, students showed positive responses to the presence of the Indonesian language learning module based on the metacognitive strategy. According to [58] the act of practicing metacognition improves overall cognitive functioning and learning processes. Metacognitive skills can enable and guide the instruction by improving learner's ability to observe the effectiveness of their own learning and, subsequently, adjust their learning processes to achieve learning outcomes. Researchers of [56] stated that students with effective metacognitive strategies also have a strong belief in their ability to perform tasks successfully. Metacognition is important for strong predictors of learning and academic success [69]. Students with good metacognition perform better at school than students with poor metacognition. Moreover, students with inadequate metacognition may benefit from metacognitive training to improve their metacognition and academic performance. Furthermore, based on research of [57], there are some metacognitive features that can be considered as domain-specific and are related to the intrinsic characteristics of the discipline. For example, the suitability and effectiveness of learning strategies depend on the domain in which they may be applied because they are mainly connected with the learning goals and the tasks defined for this specific area of knowledge.

### (iii) *Teacher Responses*

Based on the teacher response surveys which aimed to find out teacher responses, it was found that the response of Indonesian language teachers in middle schools in the City of Malang toward the presence of the Indonesian language learning module based on the metacognitive strategy was that they (1) agree to the presence of the Indonesian language learning module because it was practical and easy to use for student learning, (2) agree that the Indonesian language learning module can increase student motivation in learning the Indonesian language, (3) agree that the Indonesian language learning module informed learning goals clearly, (4) agree that the usage instructions in the Indonesian language learning module very much helped students in their

use, (5) agree that the learning journal contained in the Indonesian language learning module could help students to find out how far they have learned, (6) agree that the evaluation found in the Indonesian language learning module could help in evaluating the learning development of students, (7) agree that the texts found in the Indonesian language learning module could add to the knowledge of students, (8) agree that the material contents of the Indonesian language learning module helped students in understanding, differentiating, classifying, identifying, grasping meanings, composing, examining and revising, and summarizing texts, and (9) agree that the test of understanding of the Indonesian language learning module helped students in understanding, differentiating, classifying, identifying, grasping meanings, composing, examining and revising, and summarizing texts.

The analysis results of the teacher response surveys provide an overview of teacher responses to the developed teaching materials. Teachers showed positive responses to the presence of the Indonesian language learning module based on the metacognitive strategy. On the other hand, the teacher response is needed in dealing with the validation of the module itself. It also can guide the teacher to directly involve the use of metacognition in the module because the metacognitive skill of teachers is moderately low. According to the result of [70], the teachers had a low metacognitive profile of planning skills. By conducting this phase, the researcher can identify the teachers' responses towards the developed teaching materials.

*5.5. The Analysis Result of the Module Effectiveness.* After the product of the Indonesian language learning module based on the metacognitive strategy was evaluated and revised based on the evaluation of several experts, who were content and language experts, design experts, and media experts, as well as teachers and students, then the effectiveness was tested. Effectiveness test of the product was conducted using a pre-experimental method with a pretest and posttest design. The result of the pretest showed the ability to understand texts before the use of the Indonesian language learning module based on the metacognitive strategy and the result of the posttest revealed the ability to understand texts after the use of the Indonesian language learning module based on the metacognitive strategy. This is in accordance with [60] which stated that metacognition generally involves self-monitoring and conscious use of learning strategies. It is not an automated process, but it is the result of long-term development of the cognitive process. Metacognition, simply defined as "thinking about thinking," is a construct and process that may explain how students can improve and control their thinking and learning [62].

After pretest and posttest scores were obtained, analysis was then performed to understand the effectiveness of the usage of the module. Data analysis using the *t*-test was



TABLE 3: Paired samples statistics.

		Mean	N	Std. deviation	Std. error mean
Pair 1	Pretest	60.00	30	18.570	3.390
	Posttest	81.33	30	10.981	2.005

TABLE 4: Paired samples correlations.

		N	Correlation	Sig.
Pair 1	Pretest and posttest	30	0.507	0.004

TABLE 5: Paired samples test.

		Paired differences			95% confidence interval of the difference		T	Df	Sig. (2-tailed)
		Mean	Std. deviation	Std. error mean	Lower	Upper			
Pair 1	Pretest and posttest	-21.333	16.078	2.935	-27.337	-15.330	-7.267	29	0.000

conducted with the SPSS 16.0 program to find out the effectiveness of the Indonesian language learning module based on the metacognitive strategy. These are the results of the *t*-test from the SPSS 16.0 program.

The output of paired samples statistics explains the statistical data from respondents (Table 3). For the pretest data, the average score of the comprehension test was 60.00 (30 students were included), the standard deviation was 18.570, and the standard error mean was 3.390. For the posttest data, the average score of the comprehension test was 81.33 (30 students were included), the standard deviation was 10.981, and the standard error mean was 2.005. Thus, the average score increased by 21.33 points.

The output of paired samples correlations explains the correlations or magnitude of relationships between the pretest and posttest variables (Table 4). From the output, a correlation value of 0.507 was obtained with a significance of 0.004. This means that there is a very strong relationship between the pretest and the posttest scores.

The result of the paired samples *t*-test explains the results of the paired samples *t*-test (Table 5). The test used a significance level of 0.05 (by default, SPSS uses a significance level of 0.05) and 2-sided testing. These are the steps of the analysis: (1)  $H_0$ : there is no difference between pretest and posttest scores; (2)  $H_1$ : there is a difference between pretest and posttest results; (3) determining *t*-count: from the output, it was known that *t*-count was -7.267; (4) determining *t*-table: *t*-table can be seen in the statistics table at a significance of 0.05 :  $2 = 0.025$  (2-sided test) with a degree of freedom of (df)  $N - 1$  or  $30 - 1 = 29$  and the result for *t*-table was 2.045/-2.045; (5) testing criteria: if  $t\text{-table} \leq t\text{-count} \leq t\text{-table}$ , then  $H_0$  is accepted; if  $t\text{-count} < t\text{-table}$  or  $t\text{-count} > t\text{-table}$ , then  $H_0$  is rejected; by significance: if significance  $> 0.05$ , then  $H_0$  is accepted; if significance  $< 0.05$ , then  $H_0$  is rejected; and (6) drawing conclusions:  $t\text{-count} < t\text{-table}$  ( $-7.267 < -2.045$ ) and thus  $H_0$  is rejected—as the *t*-count is -7.267, less than the *t*-table of -2.045, it can be concluded that there is a significant difference between pretest and posttest data. This means there is a difference in the

learning results of students before and after the application of learning with the Indonesian language learning module based on the metacognitive strategy.

This shows that the use of the Indonesian language learning module based on the metacognitive strategy is effective. Findings from this study correspond to the previous work by [61] which revealed that metacognitive strategies and learning-related emotions could play an intermediary role in the relationship between students' self-efficacy and academic performance. Furthermore, this finding corresponds to the previous work by [16], explaining that students often collaborate with classmates in group learning tasks such as interactive multimedia exercises.

The Indonesian language learning module was developed based on the metacognitive strategy, with the aim of students being able to organize their learning, besides achieving the final target learning competency. For performance-based assessment tasks, students are required to provide or demonstrate knowledge and skills in activities related to student life [15]. Modern learning and educational theory emphasize the importance of students who know how to organize their learning effectively [32]. Previous research by [35] suggests that the metacognitive strategy is an important aspect in learners' listening skill.

**5.6. Implications of the Research Findings.** From theories to practices, findings from this study portray the development of a learning module to support students' learning autonomy. Given the lack of research in this area, the study yields implications for theories of materials development and its use in classroom contexts. Theoretically, developing a learning module using the strategy training model by Oxford (1990) contributes to students' autonomous learning. The development of such a module seems scant in the Indonesian setting. Additionally, perceptions of autonomous learning among teachers and students in Indonesia have not been conclusive [71]. Thus, the present study fills this lacuna.

Practically, teachers could enact the developed module in their classroom contexts as it has been designed based on the students' needs and expectations.

## 6. Conclusion

The study revealed that (1) the module requirements are determined based on the information of student needs, of whom 53% agree and 31% strongly agree with the development of the Indonesian language learning module based on the metacognitive strategy; (2) module development was conducted by integrating training of metacognitive strategies, implementation in learning, performing evaluations, and conducting revisions; (3) module appropriateness is shown by the results of content and language expert validation with 85% validity, a design expert with 93% validity, media expert with 86% validity, and practitioners with 77% validity; and (4) effectiveness of the module was known based on the analysis results of SPSS 20, and as the  $t$ -count is  $-7.267$ , less than the  $t$ -table of  $-2.045$ , it can be concluded that there is a significant difference between pretest and posttest results. The findings suggest that there is a difference in student learning results before and after the application of learning with the Indonesian language learning module based on the metacognitive strategy. This shows that the developed module could effectively enhance students' autonomous learning.

## Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## Acknowledgments

This study was funded by the Directorate of Higher Education, Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia through Penelitian Terapan Unggulan Perguruan Tinggi (PTUPT) 2019 (contract number: 120/SP2H/LT/DRPM/2019). Our thanks are also addressed to M. Faruq Ubaidillah, Universitas Islam Malang, for his feedback on the earlier draft of this paper.

## References

- [1] A. M. O'Donnell and D. F. Dansereau, "Scripted cooperation in student dyads: a method for analyzing and enhancing academic learning and performance," in *Interaction in Cooperative Groups*, Hertz-Lazarowitz and Miller, Eds., Cambridge University Press, Cambridge, UK, 1992.
- [2] M. Abdurrahman, *Education for Children with Learning Difficulties*, Rineka Cipta, Jakarta, Indonesia, 1999.
- [3] R. M. Gillies, "The effects of communication training on teachers' and students' verbal behaviours during cooperative learning," *International Journal of Educational Research*, vol. 41, no. 3, pp. 257–279, 2004.
- [4] D. A. Canelas, J. L. Hill, and A. Novicki, "Cooperative learning in organic chemistry increases student assessment of learning gains in key transferable skills," *Chemistry Education: Research and Practice*, vol. 18, no. 3, pp. 441–456, 2017.
- [5] A. Darmuki, A. Andayani, J. Nurkamto, and K. Saddhono, "Evaluating information-processing-based learning cooperative model on speaking skill course," *Journal of Language Teaching and Research*, vol. 8, no. 1, pp. 44–51, 2017.
- [6] D. Skagen, B. McCollum, L. Morsch, and B. Shokoples, "Developing communication confidence and professional identity in chemistry through international online collaborative learning," *Chemistry Education: Research and Practice*, vol. 19, no. 2, pp. 567–582, 2018.
- [7] V. D. Tran, T. M. Loc Nguyen, N. Van De, C. Soryaly, and M. N. Doan, "Does cooperative learning may enhance the use of students' learning strategies?" *International Journal of Higher Education*, vol. 8, no. 4, pp. 79–88, 2019.
- [8] A. Van Leeuwen and J. Janssen, "A systematic review of teacher guidance during collaborative learning in primary and secondary education," *Educational Research Review*, vol. 27, pp. 71–89, 2019.
- [9] J. L. Docktor, J. Dornfeld, E. Frodermann et al., "Assessing student written problem solutions: a problem-solving rubric with application to introductory physics," *Physical review physics education research*, vol. 12, no. 1, Article ID 010130, 2016.
- [10] D. Rukmini and L. A. D. E. Saputri, "The authentic assessment to measure students' English productive skills based on 2013 curriculum," *Indonesian Journal of Applied Linguistics*, vol. 7, no. 2, pp. 25–273, 2017.
- [11] K. H. Koh, "Authentic Assessment," in *Oxford Research Encyclopedia of Education*, The Netherlands, Springer, 2017.
- [12] Z. Osman, S. Anida, J. Dahlia, and O. Ani, "The teaching of Malay essay writing based on an authentic approach," *International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN*, vol. 87S2 pages, 2019.
- [13] M. Sabri, H. Retnawati, and Fitriatunisyah, "The implementation of authentic assessment in mathematics learning Journal of Physics: conference Series," *Journal of Physics: Conference Series*, vol. 1200, no. 1, Article ID 012006, 2019.
- [14] P. Sotiriadou, D. Logan, A. Daly, and R. Guest, "The role of authentic assessment is to preserve academic integrity and promote skill development and employability," *Studies in Higher Education*, pp. 1–17, 2019.
- [15] V. Villarroel, D. Boud, S. Bloxham, D. Bruna, and C. Bruna, "Using principles of authentic assessment to redesign written examinations and tests," *Innovations in Education & Teaching International*, vol. 57, no. 1, pp. 38–49, 2020.
- [16] K. Herborn, M. Stadler, M. Mustafić, and S. Greiff, "The assessment of collaborative problem-solving in PISA 2015: can computer agents replace humans?" *Computers in Human Behavior*, vol. 104, Article ID 105624, 2020.
- [17] R. Ajjawi, J. Tai, T. L. Huu Nghia, D. Boud, L. Johnson, and C. J. Patrick, "Aligning assessment with the needs of work-integrated learning: the challenges of authentic assessment in a complex context," *Assessment & Evaluation in Higher Education*, vol. 45, no. 2, pp. 304–316, 2020.
- [18] M. Mas'ud, A. Ahmad, and N. Arsyad, "The development of metacognitive skills-based teaching materials," *Journal of Education and Learning*, vol. 12, no. 4, pp. 2089–2738, 2018.
- [19] S. Ransdell, M. L. Barbier, and T. Niit, "Metacognitions about language skill and working memory among monolingual and bilingual college students: when does multilingualism

- matter?" *International Journal of Bilingual Education and Bilingualism*, vol. 9, no. 6, pp. 728–741, 2006.
- [20] H. Bozorgian, "Metacognitive instruction does improve listening comprehension," *ISRN Education*, vol. 2012, p. 1, Article ID 734085, 2012.
- [21] S. Eggert, F. Ostermeyer, M. Hasselhorn, and S. S. Bögeholz, "Decision making in the science classroom the effect of embedded metacognitive instructions on students' learning outcomes," *Education Research International*, vol. 2013, p. 12, Article ID 309894, 2013.
- [22] U. E. Nett, T. Goetz, N. C. Hall, and A. C. Frenzel, "Metacognitive strategies and test performance: an experience sampling analysis of students' learning behavior," *Education Research International*, vol. 2012, p. 16, Article ID 958319, 2012.
- [23] D. Werdiningsih, "Creative construction of pragmatic competence acquisition of preschool children," *Diksi*, vol. 15, no. 1, 2008.
- [24] D. Werdiningsih, "Communication strategies for child speakers in interaction with various speech partners in a diglossic community," *LITERA*, vol. 9, no. 2, 2010.
- [25] D. Werdiningsih, "Profile of learning strategies and its impact on achieving communication competencies of elementary school students," *Jurnal Litera*, vol. 10, pp. 1–12, 2011.
- [26] D. Werdiningsih, "Metacognitive strategies for children's learning in Indonesian language learning in elementary schools," *Jurnal Cakrawala Pendidikan*, vol. 34, no. 1, pp. 107–117, 2015.
- [27] D. Werdiningsih, "Characteristics of the acquisition strategy A pragmatic competence of bilingualism children's," *European Journal of Social Sciences*, vol. 52, no. 2, pp. 191–203, 2016.
- [28] R. L. Oxford and M. E. Ehrman, "Adults' language learning strategies in an intensive foreign language program in the United States," *System*, vol. 23, no. 3, pp. 359–386, 1995.
- [29] J. Mistar, "English learning strategies of Indonesian students across individual differences," *Asian Journal of English Language Teaching*, vol. 11, *The Chinese University of Hongkong, Hongkong*, 2001.
- [30] J. Mistar, "The effect of learning strategies on perceived English proficiency *Jurnal Pendidikan dan Pengajaran*," *FKIP Universitas Lampung*, vol. 4, no. 1, 2009.
- [31] H. Holec, *Autonomy and Foreign Language Learning*, Council of Europe, Strasbourg, France, 1981.
- [32] M. J. Lawson, S. Vosniadou, P. Van Deur, M. Wyra, and D. Jeffries, "Teachers' and students' belief systems about the self-regulation of learning," *Educational Psychology Review*, vol. 31, no. 1, pp. 223–251, 2019.
- [33] M. V. Siagan, S. Saragih, and B. Sinaga, "Development of learning materials oriented on problem-based learning model to improve students' mathematical problem-solving ability and metacognition ability," *International Electronic Journal of Mathematics Education*, vol. 14, no. 2, pp. 331–340, 2019.
- [34] A. M. Alharbi, "Building vocabulary for language learning: approach for ESL learners to study new vocabulary," *Journal of International Students*, vol. 5, no. 4, pp. 501–511, 2019.
- [35] E. Namaziandost, L. Neisi, F. Mahdavi, and M. Nasri, "The relationship between listening comprehension problems and strategy usage among advance EFL learners," *Cogent Psychology*, vol. 6, no. 1, Article ID 1691338, 2019.
- [36] S. Samuels and K. A. Jay, *Role of Automaticity in Metacognition Literacy Instruction*, University of Minnesota Twin Cities, vol. 3, 4 pages, New Jersey, NJ, USA, 2005.
- [37] L. Sunanto and N. dan Asyiah, "The effect of metacognitive strategy on learning independence of elementary school teacher education students," *Jurnal Profesi Keguruan*, vol. 4, 2018, <https://journal.unnes.ac.id/nju/index.php/jpk/article/view/142211>.
- [38] M. F. Teng and D. Zhang, "Task-induced involvement load, vocabulary learning in a foreign language, and their association with metacognition," *Language Teaching Research*, 2021.
- [39] M. Sato, "Metacognition," in *The Routledge Handbook of Second Language Acquisition and Individual Differences*, S. Li, P. Hiver, and M. Papi, Eds., Routledge, Oxfordshire, UK, 2021.
- [40] Z. Yanqun, "The significance and instruction of metacognition in continuing education," *International Forum of Teaching & Studies*, vol. 15, no. 1, pp. 29–37, 2019.
- [41] C. Lee and D. Beng dan Bergin, "Children's use of metacognition in solving everyday problems: an Initila study from an Asian context," *The Australian Educational Researcher*, vol. 36, no. 3, pp. 89–103, 2009.
- [42] A. Woolfolk, "Educational psychology: active learning edition," *Penterjemah: Helly Prajitno Soetjipto Dan Sri Mulyantini Soetjipto*, Pustaka Pelajar, Yogyakarta, Indonesia, 2009.
- [43] B. J. Zimmerman, "Becoming a self-regulated learner: an overview," *Theory Into Practice*, vol. 41, no. 2, pp. 64–70, 2002.
- [44] B. J. Zimmerman, "A social cognitive view of self-regulated academic learning," *Journal of Educational Psychology*, vol. 81, no. 3, pp. 329–339, 1989.
- [45] E. R. N. Inayah, "Achievement motivation and self-regulated learning," *Jurnal Online Psikologi*, vol. 1, no. 2, pp. 642–656, 2013.
- [46] S. Saraff, R. Pal, M. Tripathi, R. K. Biswal, and A. Srivastava Saxena, "Impact of metacognitive strategies on self-regulated learning and intrinsic motivation," *Journal of Psychosocial Research*, vol. 15, no. 1, pp. 35–46, 2020.
- [47] R. L. Oxford, *Language Learning Strategies: What Every Teacher Should Know*, Newbury House Publishers, New York, NY, USA, 1990.
- [48] R. L. Oxford, *Help Your Students Become Better Learners: Understanding, Assessing and Teaching Language Learning Strategies* Yeditepe University Graduate Seminars, Istanbul, Turkey, 2011.
- [49] N. Othman and M. Ismail Ahamad Shah, "Problem-based learning in the English language classroom," *English Language Teaching*, vol. 6, no. 3, pp. 125–134, 2013.
- [50] Riduwan, *Measurement Scale of Research Variables*, Bandung, Alfabeta Publisher, 2010.
- [51] A. Firmanto, I. Hitipeuw, M. Pali, and F. Hanurawan, "Learning style based teaching to enhance student metacognition skills (review of neuroscience learning theory)," in *Proceedings of the 4th ASEAN Conference on Psychology, Counselling, and Humanities (ACPC 2018)*, Atlantis Press, Amsterdam, Netherlands, 2019.
- [52] A. Geron, "Metacognitive skills development in basic chemistry of bachelor of industrial Technology students of Batangas State University, Philippines," *International Multi-disciplinary Research Journal*, vol. 1, pp. 102–109, 2019.
- [53] M. Liu and S. Bera, "An analysis of cognitive tool use patterns in a hypermedia learning environment," *Educational Technology Research & Development*, vol. 53, no. 1, pp. 5–21, 2005.
- [54] H. Novia, I. Kaniawati, A. Rusli, and D. Rusdiana, "The development of metacognitive awareness related to the implementation of metacognitive-based learning," *Journal of Physics: Conference Series*, vol. 1170, Article ID 012034, 2018.

- [55] B. Vadivel, E. Namaziandost, and A. Saeedian, "Progress in English language teaching through continuous professional development—teachers' self-awareness, perception, and feedback," *Frontiers in Education*, vol. 6, p. 757285, 2021.
- [56] S. Coutinho, "Self-efficacy, metacognition, and performance," *North American Journal of Psychology*, vol. 10, no. 1, pp. 165–172, 2008.
- [57] F. Liu, B. Vadivel, F. Mazaheri, E. Rezvani, and E. Namaziandost, "Using games to promote EFL learners' willingness to communicate (WTC): potential effects and teachers' attitude in focus," *Frontiers in Psychology*, p. 4526, 2021.
- [58] C. P. Commiso, *Instructional Strategies to Prepare Students for Success in Informal Learning Environments: Leveraging Metacognition and Critical Thinking to Develop Self-Regulated Learning Skills*, University of Massachusetts, Boston, MA, USA, 2019.
- [59] N. S. Wilson, V. Zygouris-Coe, and V. Cardullo, "Expert readers using an iPad to learn: implications about the role of metacognition in teaching and learning with iPads," *Ubiquitous Learning: An International Journal*, vol. 12, no. 3, pp. 1–8, 2019.
- [60] J. I. Ebomoyi, "Metacognition and peer learning strategies as predictors in problem-solving performance in microbiology," *Journal of Microbiology & Biology Education*, vol. 21, no. 1, p. 21, 2020.
- [61] A. A. Hayat, K. Shateri, M. Amini, and N. Shokrpour, "Relationships between academic self-efficacy, learning-related emotions, and metacognitive learning strategies with academic performance in medical students: a structural equation model," *BMC Medical Education*, vol. 20, no. 1, pp. 76–11, 2020.
- [62] A. K. Smith, S. Black, and L. M. Hooper, "Metacognitive knowledge, skills, and awareness: a possible solution to enhancing academic achievement in African American adolescents," *Urban Education*, vol. 55, no. 4, pp. 625–639, 2020.
- [63] R. Lan and R. L. Oxford, "Language learning strategy profiles of elementary school students in Taiwan," *IRAL-International Review of Applied Linguistics in Language Teaching*, vol. 41, no. 4, pp. 339–379, 2003.
- [64] E. Macaro, *Learning Strategies in Foreign and Second Language Classrooms*, Continuum, London, UK, 2001.
- [65] W.-T. Tseng, Z. Dörnyei, and N. Schmitt, "A new approach to assessing strategic learning: the case of self-regulation in vocabulary acquisition," *Applied Linguistics*, vol. 27, no. 1, pp. 78–102, 2006.
- [66] P. D. Pearson and J. A. Dole, "Explicit comprehension instruction: a review of research and a new conceptualization of instruction," *The Elementary School Journal*, vol. 88, no. 2, pp. 151–165, 1987.
- [67] A. Cohen, *Strategy Training for Second Language Learners*, ERIC Digest, Mahwah, NJ, USA, Lawrence Erlbaum Associates, 2003.
- [68] J. Akker, K. Gravemeijer, S. Mckenney, and N. Nieveen, *Introducing Educational Design Research*, London, Routledge, 2006.
- [69] D. Dunning, K. Johnson, J. Ehrlinger, and J. Kruger, "Why people fail to recognize their own incompetence," *Current Directions in Psychological Science*, vol. 12, no. 3, pp. 83–87, 2003.
- [70] U. Azizah and H. Nasrudin, *Empowerment of metacognitive skill through the development of instructional materials on the topic of hydrolysis and buffer solutions*, in *Proceedings of the 2nd International Joint Conference on Science and Technology (IJCST)*, Bali, Indonesia, 2017.
- [71] K. Khotimah, U. Widiati, M. Mustofa, and M. F. Ubaidillah, "Autonomous English learning: Teachers' and students' perceptions," *Indonesian Journal of Applied Linguistics*, vol. 9, no. 2, pp. 371–380, 2019.