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# Psycholinguistics and Metacognition Effect in Verbal Language Communication Ability on Practical Teaching of Physics Education Students

**Diana Rozelin[1], Sukarno[2], Muhaimin[3]**

[1]*UIN Sulthan Thaha Saifuddin Jambi, Indonesia, email: dianarozelin@uinjambi.ac.id*
[2]*UIN Sulthan Thaha Saifuddin Jambi, Indonesia, email: sukarno@uinjambi.ac.id*
[3]*Universitas Nurdin Hamzah, Indonesia, email: muhaimindjuaini@gmail.com*

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**ABSTRACT**

*This study aimed to determine and describe the influence of psycholinguistics and metacognition on the ability of physics education students to use verbal language in the learning process. Quantitative research is used to measure the level of influence between variables, and then the case study is used to determine the sample. Based on the data, it could be concluded that the ability of psycholinguistics had a positive correlation with language skills, with a correlation of 0.924 and a significance value (2-tailed) of 0.000 <0.05. Thus, it could be understood that there was a positive correlation between psycholinguistics toward language skills with a very strong correlation category. The correlation between metacognition and language skills was 0.874 with a significance value (2-tailed) of 0.000 < 0.05. Therefore, this article argues that the ability of psycholinguistics and metacognition, so the language skills of physics students in carrying out physics learning would be better. This meant that the two variables affected the verbal language skills in learning physics together and not separately. Because language skills are related to metacognitive abilities, including intellectual abilities, teachers need to consider the use of verbal language in the classroom for the cognitive development of students. To achieve this, a psycholinguistic skill development program was needed for physics education students and other prospective teacher students; they could use verbal language in both the declarative, imperative, and interrogative aspects appropriately and accurately.*

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## 1. Introduction

In teaching and learning, language is one of the important factors, without language that can be understood by teachers and students, the teaching and learning process will be disrupted

and even fail. The language skills of teachers and students significantly affect the teaching and learning process. This is as stated by Adnjani, et al. (2021), that language is the main tool for human communication. This opinion is also supported by Ridha (2017), that language is the most important medium for all human interaction and in many ways, language can be called the essence of social phenomena. Meanwhile, Purwanti (2020) states that learning activities are a communication process to convey messages from educators to students, aiming to make messages well received and affect understanding and the formation of behavioral changes. This is also reinforced by the opinion of Natsir (2017), that in the formal and non-formal learning process, the psycholinguistic process works to acquire knowledge. In line with that, Fatimah et al (2018), also stated that in the teaching and learning process, language skills are needed, for example; listening skills, speaking skills, reading skills, and writing skills. Thus, it is clear that language skills are very important in the process of teaching and learning activities. One of the language studies that are very important in the learning process is psycholinguistics. This is as stated by Hasan (2018) that psycholinguistics is very closely related to teaching and learning process activities. In line with this, Ridha (2017) states that psycholinguistics is a broad field of science that plays a role in providing various considerations, especially in the learning process. Tulus (2020) also states that psycholinguistics is a human activity in acquiring, perceiving, and producing language. Zulhannan (2018) states that psycholinguistics is the study of language behavior, both visible and invisible behavior. This is also reinforced by Yusuf (2019), that psycholinguistics is a scientific discipline that explains the nature of the structure of language, how it is processing, how it is acquired, and how to express it practically. Therefore, it can be understood that psycholinguistics in the learning process is closely related to mental processes and the ability of teachers to acquire, perceive, and produce language which in turn affects their ability to teach using verbal language.

By referring to the description above, it can be understood that psycholinguistics in the learning process is closely related to mental processes, both to teachers and students. This is also in line with the opinion from Setyawan (2020) that humans with their minds regulate the structure of their language to be spoken and then pronounce them, these two activities involve mental or psychological behavior. Therefore it can be said that psycholinguistics is also closely related to the metacognition process, namely one's awareness of one's thinking ability. Ramadhanti (2021) said that metacognition is related to a person's awareness and writing skill, and Sukarno (2021), state that metacognition is also related of their thinking and the ability to regulate their thinking in learning or solving problems.

Related to metacognition, Al-Gaseem, at.al. (2020), in his writing states that metacognition is learning, motivation, wandering thoughts, and creativity. Meanwhile, according to Marulis (2021), metacognition refers to the knowledge that people have about their thought processes. Azevedo (2020), wrote that metacognition refers to a person's knowledge of their cognitive processes or anything related to themselves, for example, the property of information or data relevant to learn. In line with this definition, Rivers, et.al. (2020), states that metacognition involves the process of monitoring and controlling cognitive processes independently. Omar (2021) also states that metacognition is closely related to thinking skills and problems solving. Thus, it can be understood that metacognition can be understood as a mental process and a person's ability to know, understand, apply, and evaluate his ability to think.

According to Uppal (2021), metacognition is a basic determinant of self-control or regulated. (Al-Gaseem et al., 2020) states that metacognitive knowledge includes knowledge about oneself as a learner and the factors that can affect performance, knowledge about strategies, and knowledge about when and why to use strategies. Metacognitive regulation is the monitoring of a person's cognition and includes planning activities, understanding awareness, task performance, evaluation of process effectiveness, and monitoring strategies. (Antonio, 2021), said that metacognition abilities include the ability to plan, control, and assess cognitive processes and strategies. Therefore, it is natural that metacognition has many functions and closely related to human life. This is as stated by Beach, et al. (2020), that metacognition has many diverse functions, such as language.

In terms of the educational or learning process, metacognition also influences performance or work results. This is as stated by Sukarno (2020), Evivania, et al. (2020), Kemalawati, at al. (2019), and Abdullah (2018) that a student's metacognition affects learning achievement. Also, Himawan (2018), wrote that metacognition can improve problem-solving skills. Cakici (2018) also states that metacognition plays a role in increasing a person's critical thinking skills. Ambarita, et al. (2022) state that metacognition related to reading ability. Thus, it is clear that metacognition has a significant effect on one's success, both in terms of the learning process and the results obtained from the process. Thus, research related to the metacognition ability of teachers in choosing and determining the language they will use in the learning process is one of the most important things.

Regarding the use of language in the learning process, Megawati (2020), states that language is an important part of learning communication both in verbal and nonverbal forms. In learning, communication or verbal language determines the success of these activities and produces excellence (Filiz, 2020). This is because language is the key to communication which is very important in the learning process. Ibrahim (2020) and Musheke (2021), states that communication is an important means for teaching staff in carrying out learning and learning activities which will build students' understanding of the material being taught. Thus, it is natural that Pranowo (2019) states that learning must integrate to education linguistic approach with education pragmatic words, both in (1) speaking and writing, and (2) listening and reading (Abdikarimova, et al., 2021).

The use of verbal language in science learning, especially physics, needs to be scrutinized and studied carefully. This is because in science-physics learning, apart from using new scientific terms for students, it often has different meanings with the same language in everyday life. For example, the word "weight", in everyday life (in Indonesia) is interpreted as a quantity with units of "kilograms"), so it only has a scalar quantity. However, in physics, the word "weight" has a different meaning, namely a quantity with units of "Newton" which has a vector and scalar quantity. Of course, the inappropriate use of the word "weight" can lead to misconceptions. Besides, the word "mass" in everyday life is understood as a group of people or time, but in learning physics, the word "mass" is to describe a group of people or time. therefore, this article wants to know in depth about the influence of psycholinguistics and metacognition toward the ability to use verbal language in the learning process of physics education students.

## 2. Literature Review

Apart from the reason for the meaning of words, research on the use of verbal language in learning physics is also very important and needs to be done, this is because learning physics is often considered difficult by some students. This is as stated by Kurniawati (2018), Toto (2017), that physics is a subject that is often considered difficult by students, even by students in universities. Also, Wijoyo (2018) and Misbahudin, et al. (2018), write in one of their studies that physics lessons are a "specter" (something very scary) to students. Therefore, teachers need to take a learning approach using verbal language that is motivating students. The difference with this research is verbal language in the learning process of physics education students.

According to several studies, the use of verbal language in the learning process can increase the motivation of students. This is as written by Suharni (2019), that there are several ways that teachers can increase student motivation, namely: 1) clarifying the goals to be achieved, 2) arousing student motivation, and 3) create a pleasant atmosphere in learning. Based on that suggestion, it is almost entirely related to the use of the teacher's verbal language in the process of increasing student motivation. This was reinforced by Sidik (2018), which found that teacher interpersonal communication skills (language) had a positive and significant effect on student learning motivation. Mega Sari et al. (2023), Rozelin & Fauzan (2020), Sucia (2017) show that the teacher's communication style has a significant effect on student learning motivation. In addition to learning motivation, the use of appropriate verbal language in learning can also improve student learning outcomes (Handayani, et al., 2021). Rozali & Rozelin (2021) and Hidayati et al., (2020), state that a significant relationship was found between communicative and learning outcome. Thus, it is clear that in-depth research on the use of verbal language by teachers in physics learning is necessary and very important to do.

## 3. Research Methodology

### 3.1 Respondents

Kind of this research is quantitative and using descriptive technique as the method. Respondents in this study were prospective physics education teacher students at the *Tarbiyah* and Teacher Training Faculty at UIN Sulthan Thaha Saifuddin Jambi. The technique in choosing the respondents is purposive sampling. These students are who take physic education microteaching courses with an online learning process. Thus, all respondents in the study were students who practiced physics learning with videos. If the respondents did not collect the learning videos as specified, then their status as respondents was denied in the study. Each respondent is required to collect 3 learning videos with different themes or sub-topics. This is so that data on psycholinguistic and metacognitive abilities can be recorded properly. The number of respondents in this study were 42 students, without distinguishing between men and women.

### 3.2 Instruments

Psycholinguistics ability data were obtained using discourse analysis on online learning videos for physics *Tadris* students. The psycholinguistics ability measured in this study is focused on the ability to absorb and produce language as mentioned by Howson, et al. (2021). Therefore, the instrument used to measure students' psycholinguistic abilities is a test

adapted based on the theory developed by Suharti, et al. (2021) with the context of learning physics. As for measuring the ability of students in terms of using verbal language during the physics learning process, it was carried out using observation sheets on learning video recordings developed by students. The observation sheet in question is a scoring rubric with a Liker scale pattern (1-5), consisting of 20 positive statements.

Measurement (data acquisition using a Likert scale has also been carried out by previous researchers, including Taluke, et al. (2019), Dimas (2021), and Suwandi, et al. (2018). The instrument in the research is also adjusted to the opinion (Mawardi, 2019). This measurement of verbal language skills is focused on the student's ability to use terms in physics related to the topic being taught both orally and in writing on the blackboard, in this case is to absorb and produce words. The measurement includes the form of teacher verbal behavior when providing reinforcement, namely: (1) declarative form of speech, (2) imperative, and (4) interrogative.

The metacognition ability measured in this study includes the ability of physics *Tadris* students in terms of planning learning, controlling the implementation of learning, and assessing the learning process they are doing (Dewi, et al., 2021). Thus, the instrument used to measure students' metacognitive abilities in the form of a questionnaire consisting of 20 positive statements on a scale using a Likert scale (1-5). The instrument was given to students shortly after they sent physics learning videos via a Google form. Thus, the minimum score obtained by each respondent is 20 and the maximum score is 100, both in Psycholinguistics ability and metacognition ability.

### 3.3 Procedures

As previously stated, the purpose of this research was to answer the question of how the psycholinguistics and metacognition abilities of students influence the ability to use verbal language in teaching physics. Thus, the research was quantitative with survey and case study methods, is a series of scientific activities that are carried out intensively, in detail and in depth about a program, event, and activity, either at the individual level, a group of people, institutions, or organizations to gain in-depth knowledge about events, i.e. physic education teaching and learning process (Rahardjo, 2017). The quantitative was used to measure the level of influence between variables. The survey method was used because the number of physics students is relatively large, while the case study used to determine the sample. The case study was used to choose the sample in this study were physics students who taught (practice teaching) online during the COVID-19 pandemic. Thus, the data were obtained through the analysis of the instructional videos.

### 3.4 Data Analysis

In this study, data analysis was carried out in two stages. The first stage was to classify the students' abilities in each variable based on the scores obtained, namely the "high", "medium", and "low" categories. This is done by making a range to get a total score for each respondent. The score or value entered or calculated is the average score of the learning video activities that have been collected by physics Tadris students. A score of 20-50 is classified as a "low" category, a score of 51-80 is classified as a "medium" category and a score of 81-100 as a "high" category. The next stage of data analysis is to calculate the percentage in each of these categories.

The third stage of analysis was statistical analysis, using product-moment correlation. This analysis aimed to determine the effect of various psycholinguistic abilities on the use of verbal language and the effect of metacognition skills on the use of verbal language during the physics learning process. Furthermore, the test was also carried out to see whether the two variables, namely: psycholinguistic ability and metacognition ability together affected the use of students' verbal language in physics learning. The analysis used in this study is to use product-moment correlation as carried out by experts in previous studies (Arosyadi & Suyantiningsih, 2020; Sembiring et al., 2021; Afri et al., 2022).

## 4. Results and Discussions

As previously explained, the focus of this study was to answer the question of how the influence of students' psycholinguistics and metacognition abilities on the ability to use verbal language in teaching physics. Thus, there were three variables to be measured and correlated, namely: (1) psycholinguistics ability, (2) metacognition ability, and (3) teacher verbal language skills in physics learning. Based on the results of measurements with previously developed instruments, the following data were obtained successively.

### 4.1 Psycholinguistics Ability

Based on the tests conducted using an instrument that adapted from the Word Association Test developed by Ross et al. (2007), with the context of learning physics, then a categorization analysis was carried out. The results of the analysis were as shown in Table 1 below:

*Table 2. Psycholinguistics Ability of Physics Tadris Students*

| Aspect | Category | Number of Students | Percentage |
|---|---|---|---|
| Infuse the Word | High | 13 | 28,26 |
| | Medium | 21 | 46,66 |
| | Low | 12 | 26,18 |
| Total | | 46 | 100% |
| Producing Words | High | 22 | 47,82 |
| | Medium | 14 | 30,43 |
| | Low | 10 | 21,74 |
| Total | | 46 | 100% |

Based on table 1, it was known that the Psycholinguistics ability of students is quite good. In terms of absorbing the words spoken when giving physics lessons, 46.66% were in the "medium" category, 28.26% were in the "high" category and 26.18% were in the "low" category. As for the context of producing words, as many as 47.82% of students were in the "high" category, 30.43% were in the "medium" category, and as many as 21.74% were in the "low" category. Based on these data, it could be understood that in general, physics *Tadris* students had relatively good psycholinguistics skills. Students were able to teach physics by using language appropriate to the cognitive level and psychological situation of the students.

### 4.2 Metacognition Ability

The results of measuring the metacognition ability in the online learning process of the microteaching program students are as shown in Table 2 below:

Table 3. The Metacognition Ability of Physical Students in Learning

| Aspect | Category | Number of Students | Percentage (%) |
|---|---|---|---|
| Plan Learning | High | 23 | 50 |
| | Medium | 19 | 41,30 |
| | Low | 4 | 8,70 |
| Total | | 46 | 100% |
| Controlling Learning | High | 22 | 47,82 |
| | Medium | 14 | 30,43 |
| | Low | 10 | 21,74 |
| Total | | 46 | 100% |
| Assessor Reflect | High | 13 | 28,26 |
| | Medium | 21 | 46,66 |
| | Low | 12 | 26,18 |
| Total | | 46 | 100% |

Referring to Table 2, it is known that in general, this ability is quite good. Each aspect assessed was dominated by students with abilities in the "medium" and "high" categories. In detail, for the aspect of planning to learn as much as 50% of students are included in the "high" ability category. The students with "medium" ability as much as 41, 30% and the remaining 8.70% had the ability category "low". In the aspect of controlling learning, as many as 47.82% of students had the ability with the "high" category, while 30.43% had the "medium" ability and the remaining 21.74% had the "low" category. As for the aspect of assessing or reflecting on the learning process they did themselves, it was dominated by students with the "medium" category, 46.66%. Meanwhile, students with the ability of "high" and "low" categories were 28.26% and 26.18%, respectively. Thus, it could be understood that in general, the metacognition abilities of students were relatively good.

### 4.3 The Teacher's Verbal Language Skills in Physics Learning

The results of measuring the skills of using verbal language in the online learning process of the microteaching program students are as shown in Table 3 below:

Table 4. Teacher's Verbal Language Ability in Learning Physics

| Aspect | Category | Number of Students | Percentage |
|---|---|---|---|
| Declarative | High | 27 | 58,70 |
| | Medium | 16 | 34,78 |
| | Low | 3 | 6,52 |
| Total | | 46 | 100% |
| Imperative | High | 22 | 47,80 |
| | Medium | 21 | 45,70 |
| | Low | 3 | 6,50 |
| Total | | 46 | 100% |

By paying attention to Table 3, in the three aspects of language that were measured in general, it showed that these abilities were relatively good. In the declarative aspect of verbal language skills, 58.70% of these abilities were in the "high" category. The ability in the "medium" category was 34.78% and the rest 6.54% was in the "low" category. Likewise in the imperative language aspect, 47.80% of physics *Tadris* students had the "high" category. The ability with the "medium" category was 45.70% and the remaining 6.50% had "low" ability. Furthermore, in the aspect of interrogative language, the ability of physics students in the

"high" category was 47.82%, then the ability in the "medium" category was 30.43% and the ability "low" was 21.74%. Based on these data, it could be said that in general, the verbal language skills of physics *Tadris* students in implementing physics learning were relatively good.

### 4.4. Correlation between Variables

Furthermore, to determine the correlation between psycholinguistics abilities and cognitive abilities toward the ability to use verbal language, a correlation test was carried out. The test result was shown as shown in Table 4 below:

Table 5. Correlation of the ability of Psycholinguistics and Metacognition toward the ability to use verbal language

| | | Psycholinguistics | Metacognition | Language skills |
|---|---|---|---|---|
| Psycholinguistics | Pearson Correlation | 1 | .927** | .924** |
| | Sig. (2-tailed) | | .000 | .000 |
| | N | 42 | 42 | 42 |
| Metacognition | Pearson Correlation | .927** | 1 | .874** |
| | Sig. (2-tailed) | .000 | | .000 |
| | N | 42 | 42 | 42 |
| Language skills | Pearson Correlation | .924** | .874** | 1 |
| | Sig. (2-tailed) | .000 | .000 | |
| | N | 42 | 42 | 42 |

**Correlation significant at the 0.01 level (2tailed).

Based on the table above, it could be seen that the correlation between Psycholinguistics and Language skills was 0.924 with a Significance (2-tailed) value of 0.000 <0.05. Thus it could be understood that there was a positive correlation between psycholinguistics on language skills with a very strong correlation category. The correlation between metacognition and language skills was 0.874 with a significance value (2-tailed) of 0.000 <0.05. Besides, based on the data it was also known that the value of R (Pearson correlation) was positive. It meant that better ability of Psycholinguistics and Metacognition so the language skills of physics Tadris students in carrying out physics learning will also be better.

Furthermore, to find out whether the two variables, Psycholinguistics and Metacognition, jointly affect language skills, the F test was performed. Based on the result of the F test used SPSS 16 software, the following results were obtained:

Table 6. F Test of Variance Analysis

**ANOVA**[b]

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 5779.452 | 2 | 2889.726 | 115.991 | .000[a] |
| | Residual | 971.620 | 39 | 24.913 | | |
| | Total | 6751.071 | 41 | | | |

a. Predictors: (Constant), Metacognition, Psycholinguistics

b. Dependent Variable: Language skills

Based on the F test results table above, it could be seen that the F value was 115.991 and the F-table value at the 95% confidence level is 3.24. As for the value of sig. 0.000 <0.05. Thus the data said that psycholinguistics and metacognition together or simultaneously affect language skills. The results of the F test as described above were also reinforced by the T-test, which was shown in the T-test table below:

Table 6. T-Test on Variables

**Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. |
| 1 | (Constant) | 8.796 | 2.382 | | 3.692 | .001 |
| | Psycholinguistics | 2.376 | .475 | .808 | 4.998 | .000 |
| | Metacognition | .091 | .117 | .125 | .773 | .444 |

a. Dependent Variable: Language skills

Based on the results of the T-test, it was known that the sig. on the Psycholinguistics variable was 0.00 <0.05, while the metacognition variable had a sig value. 0.444> 0.05. This meant that the two variables affect the verbal language skills in learning physics together and not separately. This meant that the variables of Psycholinguistics and Metacognition together influencing the ability of physics students to carry out learning.

As mentioned above (Table 1), based on these data it could be understood that in general physics Tadris students have relatively good psycholinguistics abilities. Students were able to teach physics by using language appropriate to the cognitive level and psychological situation of the students. This showed that every word used by the teacher could be understood properly by the student. Besides, it could also be said that they were able to explain every symbol or term in physics correctly and accurately. With this relatively good psycholinguistics ability, it provided good opportunities for students to be able to understand every word and sentence used by the teacher during the learning process. This was as stated by Lumentut & Lengkoan (2021), that the ability of Psycholinguistics was closely related to learning (achievement and linguistic education). This meant that teachers with good psycholinguistics skills would be better able to understand the linguistic in education and learning process so that the process could run more effectively.

Referring to Table 2, it could be seen that in general, the students' metacognition abilities were relatively good. The three aspects measured, showed that their ability in terms of planning, controlling, and assessing the implementation of physics learning was relatively good. As stated by Urban, et al. (2021) that metacognition was closely related to learning, motivation, thinking, and creativity. Thus, the data above (Table 2) also showed that in general, physics students had good motivation and creativity during the physics learning process. Also, if we referred to the opinion (Rivers et al., 2020), which stated that metacognitive knowledge included knowledge about oneself as a learner and factors that could affect performance, knowledge about strategies, and knowledge about when and why the strategies were used. It could be understood that using verbal language during the learning process was in line with students' planning, even though it was not written in the learning plan they had compiled. Therefore, it could be said that the cognitive abilities of language (including the language of science) of physics students were relatively good.

As for the ability to use verbal language (Table 3), it showed that in general, the verbal language skills of physics Tadris students in implementing physics learning were relatively good. From the three aspects that were measured, declarative, imperative, and interrogative, it was relatively good. By referring to the opinion of Alsaig, et al. (2020), that declarative language was a statement language with an ordinary song, it could be understood that the ability of physics students to provide a statement or declarative language varies greatly, for example in terms of conveying certain concepts and in making conclusions. As for the imperative aspect of the ability, namely the ability to give instructions or orders, submit and request (Rodd & Sanders, 2018); showed politeness in using language (Susilaningtyas, et al., 2018). Besides, imperative sentences also involved the language of the invitation, giving an explanation, and giving permission (Darmawanti, et al., 2019). Thus, the data above (Table 3) also meant that the ability of physics students in explaining the material, giving instructions in learning, providing learning motivation, and so on was relatively good. Whereas in the interrogative aspect, namely language skills in terms of asking questions (Fadilah & Zainil, 2020), students during learning were relatively good.

According to Boca (2021), teacher behavior forms in the learning process were: (1) forms of teacher verbal behavior when providing reinforcement were declarative, imperative, and interrogative forms of speech, while nonverbal behavior was gestural, facial, and postural; (2) the function of the teacher's verbal behavior when providing reinforcement was expressive, directive, representative, commissure, and declaration, while the function of nonverbal behavior was to complete and emphasize; and (3) the impact of teacher verbal and nonverbal behavior when providing reinforcement was that the students feel happy and motivated to learn. Thus, it could be understood that the language proficiency of physics students as described in Table 3 also showed that the teacher's behavior in implementing learning is relatively good.

Language skills with declarative, imperative, and interrogative aspects were very important in the learning process, including in terms of learning physics. With these language skills in the declarative, imperative, and interrogative aspects, the teacher was able to provide a good and systematic explanation of learning material, provided motivation, and instruction during learning appropriately. The teacher was able to ask questions that were accurate by the learning situation and conditions. In other words, with good verbal language skills, the learning process took place in a conducive and directed way. As mentioned by Salmawati, et al. (2017) that there were several basic teaching skills, including questioning skills, skills to provide reinforcement, skills to varying, explanation skills, skills to open and close lessons, skills guiding small group discussions, and class management skills were closely related to these language skills. This was also reinforced by Rahayu et al. (2019) that the skill of asking questions for science teachers in a learning process was very important. Probing queries can advanced the abilities of the educator or scholars in demanding inquiries besides thoughts (Mandaniyati & Sophya, 2017).

Furthermore, related to the correlation between variables, the correlation between psycholinguistics and cognitive abilities on the ability to use verbal language (Table 4), it appeared that the ability of Psycholinguistics was positively correlated with language skills, with a correlation of 0.924 with a significance value (2-tailed) of 0.000 <0, 05. Thus, it could be understood that there was a positive correlation between psycholinguistics on language skills with a very strong correlation category. The correlation between metacognition and

language skills was 0.874 with a significance value (2-tailed) of 0.000 <0.05. Therefore, it could be said that better ability of Psycholinguistics and Metacognition so the language skills of physics Tadris students in carrying out physics learning will also be better. The effect of these two variables on verbal language skills in the physics learning process occurred simultaneously (Table 5 and Table 6), this meant that the two variables affect the verbal language skills in learning physics together and not separately. This meant that the variables of Psycholinguistics and Metacognition together influencing the ability of physics students to carry out learning.

The test result above showed that this study was in line with Lumentut & Lengkoan (2021) research, that there was a relationship between psycholinguistic abilities and achievement plus linguistic wisdom. As for building language skills according to Isnaniah (2020), it could be done through the development of intellectual intelligence (metacognition). Besides, the results of Tamaji (2019) study also showed that the data was in the correlation between language, thoughts, culture, and communication approaches. The communicative approach for language learners demands the performance of communicative competence, including grammatical, sociolinguistics, strategic, and discourse (Canale & Swain, 1980; Celce-Murcia et al., 1995). The teachers and students may perform discourse-based teaching (Fauzan & Nadia, 2024; Fauzan & Saparuddin, 2023) to understand the use of language to provoke certain ideologies (Fauzan, 2018). This was also reinforced by the opinion of Nefdt, et al. (2020) that the language and cognitive science had a close relationship. Jackson et al. (2021) showed that linguistic can improvement psychosomatic knowledge. Therefore, this study clearly stated that this relationship had been tested statistically with confidence.

The findings in this study (Table 3, Table 5, and Table 6) indicated that in general the communication or verbal language used by teachers, including physics teachers, in the learning process also showed psycholinguistic abilities and metacognitive abilities. Thus, it could be said that determine a person's psycholinguistic abilities and metacognition abilities could be seen from their verbal language skills or the way they express their opinions, ideas, or ideas verbally. This is in line with the research of Guerrero (2020), which stated that language could invite systematic representations related to numerical abilities. Dotsevych (2019) also stated that a metacognition strategy or approach could be used as an alternative in improving a person's language skills, including difficult language. Mohammad et al. (2018), also stated that the learning process in the classroom, including the communication process (language) used, was an application of metacognition abilities. This also indicated that psycholinguistic and metacognition variables were very influential in the learning process in the classroom.

The results of the research and the discussion of the research implied that teachers, including science teachers, should master good language skills as one of the main requirements for the success of the learning process in the classroom. Because language skills were related to metacognitive abilities, including intellectual abilities, teachers need to consider the use of verbal language in the classroom by the cognitive development of students. To achieve this, a psycholinguistic skill development program was needed for physics education students and other prospective teacher students so that they were able to use verbal language in the declarative, imperative, and interrogative aspects appropriately and accurately. Of course, this had an impact on a conducive learning process and optimal learning outcomes.

## 5. Conclusion

Based on the data and discussion as described above, at the end of this study it could be concluded that the ability of psycholinguistics was positively correlated with language skills, with a correlation of 0.924 with a significance (2-tailed) value of 0.000 <0.05. Thus, it could be understood that there was a positive correlation between psycholinguistics on language skills with a very strong correlation category. The correlation between metacognition and language skills was 0.874 with a significance value (2-tailed) of 0.000 <0.05. Therefore, it could be said that better ability of psycholinguistics and metacognition so the language skills of physics *Tadris* students in carrying out physics learning will also be better. The effect of these two variables on verbal language skills in the physics learning process occurs simultaneously. This meant that the two variables affect the verbal language skills in learning physics together and not separately. This meant that the variables of psycholinguistics and metacognition together influencing the ability of physics students to carry out learning. The test results above stated that this relationship had been tested statistically convincingly. Because language skills were related to metacognitive abilities, including intellectual abilities, teachers need to consider the use of verbal language in the classroom by the cognitive development of students. To achieve this, a psycholinguistic skill development program was needed for physics education students and other prospective teacher students so that they were able to use verbal language in the declarative, imperative, and interrogative aspects appropriately and accurately.

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