

## **Implementation of Teachers' Pedagogy in Developing Basic Competence in Subject that Contain Metacognitive**

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### **Abstract**

This study aims to find out how the application of teacher pedagogy influences the development of basic biology competencies that contain metacognitive elements. The subjects of this study were teachers and students from schools A and B. The selection of subjects was based on differences in school admissions. The research method used is descriptive research. The results of this study indicate that the pedagogical implementation of teachers A and B is equally high in directing motives. Teacher A focuses more on interactions that occur between fellow students, and teacher B focuses more on interactions between teachers and students. The results of this study indicate that based on the mapping of class interactions according to the Verbal Category Interaction System, school A has the highest frequency of 28.3% occurring during group discussion activities. In school B, it has the highest frequency of 20.1%, which occurs during group discussions and presentations. Student B's metacognitive knowledge is better able to demonstrate metacognitive knowledge than student A.

**Keywords:** Pedagogy, Teacher, Metacognitive, Student.

### **Abstrak**

Penelitian ini bertujuan untuk mengetahui bagaimana pengaruh penerapan pedagogi guru terhadap perkembangan kompetensi dasar biologi yang mengandung unsur metakognitif. Subyek penelitian ini adalah guru dan siswa dari sekolah A dan B. Pemilihan mata pelajaran didasarkan pada perbedaan penerimaan sekolah. Metode penelitian yang digunakan adalah penelitian deskriptif. Hasil penelitian ini menunjukkan bahwa implementasi pedagogik guru A dan B sama-sama tinggi dalam mengarahkan motif. Guru A lebih memfokuskan pada interaksi yang terjadi antar sesama siswa, dan guru B lebih memfokuskan pada interaksi antara guru dan siswa. Hasil penelitian ini menunjukkan bahwa berdasarkan pemetaan interaksi kelas menurut Verbal Category Interaction System, sekolah A memiliki frekuensi tertinggi yaitu 28,3% terjadi pada saat kegiatan diskusi kelompok. Di sekolah B memiliki frekuensi tertinggi yaitu 20,1% yang terjadi pada saat diskusi kelompok dan presentasi. Pengetahuan metakognitif siswa B lebih mampu mendemonstrasikan pengetahuan metakognitif dibandingkan siswa A.

**Kata Kunci:** Pedagogi, Guru, Metakognitif, Siswa.

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## **INTRODUCTION**

The learning process in schools is an important part of education. Teachers and students are actively involved in the teaching and learning process. The teacher is not just a provider of knowledge to students but a professional who can make students able to plan, analyze, and conclude the problems they face. The teacher can manage the learning process, which involves students directly in teaching and learning activities. The teacher creates cooperation between students and makes learning more effective, orderly, and interesting. Teachers are equipped with various competencies for supporting

teaching activities. One of them is pedagogical competence, which is the ability to understand students in depth in the implementation of educational learning (Astuti et al., 2023).

The teacher's pedagogical competence is also always related to aspects of how the teacher teaches and aspects of mastery of the teacher's material (Parinussa et al., 2023). Implementation of teacher pedagogy relates to verbal interactions that occur during the learning process. Verbal interaction can describe teaching patterns, whether teaching focuses on the teacher (teacher-centered) or students (student-centered) (Herlanti, 2015). In addition, verbal interaction can be used to observe the level of student participation in class learning (Roshayanti, 2010). As for viewing verbal interactions that occur during the teaching and learning process, you can use the VICS (Verbal Interaction Category System), which was popularized by Flanders. VICS can describe the percentage of interactions between teachers and students, students with other students, and students with various other materials (Driel & Berry, 2016).

The government has included in the annex to Permendikbud No. 21 of 2016 that metacognitive knowledge is the graduation standard for students from elementary to secondary levels. Metacognitive knowledge is knowledge about cognition and awareness of self-knowledge (Nugroho et al., 2023). SMA/MA students will find it very difficult to master metacognitive knowledge at the detailed, specific, and even complex stage. Particularly in the subject of biology, when viewed from the results of the PISA study team, which specifically examined the quality of education in various countries with the subject of students aged 15 years, PISA explained that the level of educational science literacy in Indonesia was ranked 10th lowest out of several countries studied with a score of 403, while the highest were Singapore and Japan with scores of 556 and 538, respectively.

Implementation of teacher pedagogy is expected to cover the realm of metacognitive knowledge so that students can know about their own abilities and understand the learning material as a whole (Lorin & Krathwohl, 2010). Rompayom et al. categorize metacognitive knowledge into declarative, procedural, and conditional knowledge (Ramayulis, 2013). Declarative knowledge means that students have knowledge of the data, information, or sources needed to perform the tasks assigned. Procedural knowledge is self-confidence about how to answer a given task (Kamaruddin et al., 2023). Conditional knowledge is knowledge about when and why a strategy was chosen in answering questions (Nurdin, 2020).

## **METHOD**

The method used in this research is the descriptive analysis method. In this study, aspects that will be examined are teacher pedagogy, interactions that occur between teachers and students, and students' metacognitive knowledge in the biology material that teachers teach. Researchers used three instruments in this study, namely: tests, interviews, and observations. The use of data analysis techniques in this study uses qualitative analysis techniques.

## **RESULT AND DISCUSSION**

Based on the results of the interviews, the teacher of school A did not provide information to students directly but rather drew from the results of observations that students had made before regarding observations of *Pogonatum sp* moss. If an error occurs, it is the teacher who provides direction and understanding. Based on subject matter, syntax is more dominant than content, namely, how students can get definite answers and be accounted for. This can be seen from the teacher's suggestion that students look for references when working on worksheets, both from books and official websites, as well as from e-books that have been recommended. In addition, during group presentations, the teacher appoints a group to lead the presentation. The selected group reads the data from the entire group and compares each characteristic of moss plants with other groups. If there are many differences in the data, the teacher will ask the source used by each group and choose the correct data as a reference.

The knowledge of student A is dominantly intellectual (students can understand because of the procedures followed by the teacher. Students know that mosses have multicellular cells; the characteristics of roots, stems, and leaves are still similar; the location of the spore box for each species of moss plant; the classification of mosses; the role of mosses; and the reproductive cycle of mosses, but only to the extent of knowing. The teacher deliberately arranges learning so that students can find and analyze answers that are written independently, according to accountable references. So that the teacher can ask for sources that students quote if there is an error during learning and students get definite knowledge from the correct source as a learning reference.

School A teacher tries to build a two-way interaction by asking questions of students, but this is not balanced by student initiative in providing answers or feedback, so the teacher repeats the same questions a lot so that students respond directly to the teacher's questions. The teacher is more of a facilitator of learning. The teacher observes a lot in group discussions so that the discussion runs intensively and quietly, and during presentations, the teacher interacts after students have finished voting and found many differences in the answers. This is indicated by the percentage of interaction areas between fellow students, which is around 48.75% greater than the interaction between students and teachers, which is around 46.33%.

Teacher B uses the 2013 curriculum with the discovery learning method; even though she uses the 2013 curriculum, the teacher provides a lot of directive input to students in teaching the Pterydophyta subchapter. Teachers focus more on students to understand learning material as much as possible through interactions between teachers and students during learning, so that teaching tends to be teacher-centered. According to Teacher B, using lectures in dense biology subjects is necessary in Subject Matter Pedagogy (PMS), which primarily carries out informing and eliciting motives. Lectures on learning can make students interested in the material being taught, so that they have no difficulty understanding LKS and quickly understand learning. Students can replace the time spent

looking for answers in various sources by looking for answers in one source that the teacher has shared.

Teachers in subject matter are more dominant in presenting learning content. This can be seen from a learning resource that the teacher distributes to each student to answer the LKS. The learning resources are in the form of PowerPoint slides in hard copy and soft copy. The teacher has analyzed and included all the content in the power point slide according to the standards of the students at school. Each group of students brought a laptop to see clear pictures, videos, and metagenesis charts for each species in the Pterydophyta division. The teacher distributes learning resources to students to make them focus on finding all the available LKS answers in learning resources, plus specimens of mosses and ferns that the teacher always carries, so that each student can directly link the information in PowerPoint with the available specimens.

Students on average directly ask the teacher for help in understanding the mechanism of spore dispersal and metagenesis in ferns, and the teacher provides a lot of input and direction for each group. The dominance of teachers Pedagogical motives can be seen as a consequence of the amount of content needed to construct a learning topic. Knowledge of students is more dominant than plausible knowledge (students can understand procedures because they relate to their experiences). This can be caused by several factors. Students on average directly ask the teacher compared to fellow students when they find difficulties answering questions on the LKS. The teacher explains to each group about the difficulties experienced, so that in each group there is always a conversation between the teacher and students. The teacher does not just explain to the students but also provides questions and answers, again guided by the available sources, so that the students can understand the explanation given by the teacher. Students quickly respond to questions that the teacher gives, both in group discussions and group presentations, so that communication goes well. During group presentations, the teacher makes corrections when students make mistakes in giving answers, both in reading out the characteristics of ferns and in writing the life cycle of ferns.

## **CONCLUSION**

Implementation of Teacher A's Pedagogy emphasizes the process of interaction that occurs between fellow students, while Teacher B emphasizes the process of interaction between the teacher and students. Teacher A gives a lot of time to students during group discussions and group presentations. Teacher B has lots of discussions with students, starting from the beginning to the end of learning. The number of times Teacher A's pedagogy has been implemented is 36, and Teacher B's is 50. There are almost as many pedagogical directing motives for Teacher A as there are for Teacher B, while there are fewer informing and eliciting motives for Teacher A than for Teacher B. The implementation of teacher pedagogy is related to the VICS (Verbal Interaction Category System) that occurs in class. The percentage of VICS interaction in School A is more student-to-student, with a total area percentage of 48.75%. The percentage of VICS in school B is more related to the

relationship between teachers and students, with a regional percentage of 62.74%. The metacognitive knowledge of student A is lower than that of student B in the Plantae material. Student B is more able to explain the knowledge (declarative) and steps (procedural) needed in answering questions. This difference in metacognitive knowledge is related to several factors, namely: the breadth of material, school achievement targets, the background abilities of students, and available facilities.

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