An Implementation of Teacher Pedagogy on Students' Biology Learning Outcomes at SMAN Bukit Sundi, Solok District

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ABSTRACT

This research started from the problem of low student learning outcomes on the virus learning material, evidenced by the below-standard quiz scores. Therefore, the learning outcomes were not as expected. This research aims to know the implementation of biology learning in senior high school, which includes the design, implementation, and assessment of learning. The research informants were teachers of biology and Senior high school students. This type of research is descriptive with a qualitative approach. Based on the findings, it can be concluded that (1) the teachers are not contextually planning the learning. (2) The teachers are not effectively and efficiently implementing the learning due to (a) the lack of effective time utilization, (b) the lack of ability to establish and select instructional media appropriate to the criteria of the learning material, and (c) the poor quality of laboratory equipment. (3) The teachers assess student learning outcomes despite the incorrect procedures.

Implementasi Pedagogik Guru terhadap Hasil Belajar Biologi Siswa SMAN Bukit Sundi Kabupaten Solok

ABSTRAK: *Penelitian ini berawal dari permasalahan rendahnya hasil belajar siswa. Hal ini terbukti dari hasil kuis siswa yang berada dibawah (KKM) sehingga nilai Biologi tidak sesuai yang diharapkan. Penelitian ini bertujuan untuk mengetahui implementasi Pedagogik guru dan hasil pembelajaran biologi di SMAN Bukit sundi yang meliputi implementasi dan penilaian hasil pembelajaran. Informan dalam penelitian ini adalah guru biologi, siswa kelas X. Jenis penelitian deskriptif dengan pendekatan kualitatif. Berdasarkan temuan hasil penelitian tersebut terlihat (1) Guru tidak merencanakan pembelajaran secara kontekstual dengan konteks pembelajaran dilaksanakan. (2) Guru yang menerapkan pembelajaran belum efektif dan efisien karena: (a) Guru belum memanfaatkan waktu secara efektif, (b) Guru belum dapat menetapkan dan memilih media pembelajaran (c) pembelajaran belum efektif karena terbatasnya peralatan laboratorium. (3) Guru melakukan penilaian hasil belajar dengan prosedur yang belum tepat.*

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INTRODUCTION

Pedagogic competence is the teacher's ability to manage student learning which at least includes understanding, insight, or educational foundation, understanding of students, curriculum development, lesson planning, implementation of educational and dialogic learning, utilization of learning technology, evaluation of learning outcomes, and development students to actualize their various potentials (Purwati et al., 2020);(Ouahi et al., 2022). Handoko et al. (2021) state that the knowledge of general pedagogy and teaching skills influences learning as a determinant of the quality of learning and student motivation.

Professional competence is the teacher's ability to master science, technology, arts, and cultural knowledge. Teachers are taught to master learning material broadly and in-depth following the standard content of formal education unit programs, subjects and subject groups, concepts, and methods of scientific disciplines and technology, and relevant cultural arts that are in line with these formal education units (Suciyati et al., 2020);(Putri et al., 2020). This statement agrees with Haka et al., (2020) that teachers must possess professional competence as a basis for mastering classes with students.

Professional teachers master the knowledge or are experts in their field, master learning strategies, and educational and teacher insights, and have skills in learning (Budnyk, 2019). The link between teacher pedagogical competence and professional competence will be a benchmark for the learning material mastery to be taught to the students. A teacher must master all competencies in an integrated manner (Octavianingrum, 2020). Teachers' pedagogical competence is a way to improve student learning outcomes. Pratama et al. (2020) claim teachers must have academic and professional competencies to increase student motivation and learning outcomes.

Formal education is a learning process that involves various components, including teachers, students, learning objectives, learning materials, methods, media, and learning environment (Sari et al., 2021). Handayani et al. (2022) state that the learning process includes interaction and mutual communication between teachers and students in educative situations to achieve learning objectives. Furthermore, Fatihah et al. (2022) claim that in terms of students, the lack of willingness and motivation to learn is a problem that often occurs in the learning process, and there is still a lack of mastery of concepts.

Based on information from the biology teacher at SMAN Bukit Sundi, Solok Regency, virus material is one of the materials with low learning outcomes. It can be seen from the percentage of student learning completeness, which ranges from 29% -64% (see Table 1). Teachers can also overcome this problem to improve student learning outcomes which is in line with the opinion of Citraningrum et al. (2022), which states that learning effectiveness is all efforts made by teachers to help students learn well. Good learning outcomes will be easy to achieve if the teacher can realize the effectiveness.

Table 1. The Percentage of Completeness of Quiz Scores on Virus Material for the Tenth-Grade Students of SMAN Bukit Sundi

NO	Class	Criteria of Minimum Mastery	Completeness Criteria (%)
1	X_1	65	29,5
2	X_2	65	64

An ineffective learning process caused low learning outcomes in virus material, lack of student motivation in learning, incomplete facilities and infrastructure, unprofessional teaching methods and media used, and limitations of other learning resources. This statement aligns with Angelica & Novitasari (2020) that facilities, infrastructure, and methods that are less supportive of the learning process will affect student learning outcomes and motivation. According to Timm & Barth (2021);(and Liao et al., 2021),

professional teaching staff should assume and carry out their responsibilities as teachers towards their students, parents, community, nation, state, and religion. Teaching staff are required to better prepare everything before the lecture takes place. Haka et al., (2022) argue that three main factors must be considered by teaching staff in carrying out the learning process. The first is the planning stage of the learning process, the second is using the teaching approach (props), and the third is the evaluation of learning outcomes. These three stages must be taken at any time in carrying out learning or lectures. If one stage is left out, it cannot be said to be a learning process.

Process standards are national education standards relating to implementing the learning process in educational units to achieve graduate competence, including planning, implementing, and evaluating (Helda & Syahrani, 2022);(Scull et al., 2020). Teachers as teaching staff have an essential role in the success or failure of education in schools. Teachers must motivate students to learn actively, innovatively, creatively, effectively, and fun. Students are given the most comprehensive opportunity to be physically and mentally involved. Besides, conditions that stimulate students' interest in participating in learning must be created. Yolida et al. (2022) state that learning motivation is the psychological driving force in a person that can lead to learning activities. The higher a person's learning motivation, the better the activity for good learning outcomes. Based on the information above, the researchers were interested in conducting research at the high school level to achieve these learning objectives through research entitled "An implementation of teacher pedagogy on students' biology learning outcomes at SMAN Bukit Sundi, Solok District."

METHOD

This research is descriptive research with a qualitative approach. The data analysis is carried out with an interactive cycle model through a series of processes, data reduction, data presentation, and data verification (Rusdiman et al., 2022). This research examines all learning activities on virus material, which includes planning, processes, and assessment of learning outcomes. One or more research methods are usually chosen to collect the necessary data at this stage. Data collection techniques used in this study were observation, interviews, and documentation studies.

1. Observation

The observation activities in this research were carried out through direct observation with biology teachers in learning activities.

2. Interview

The interviews were conducted with teachers and the tenth-grade students of SMAN Bukit Sundi, Solok Regency.

3. Documentation

The documentation contains verbal data in writing. Sileyew (2019) states that data from documentation studies is secondary data. The documentation study was to reveal accurate administrative data, such as geographical data, organizational structure, personnel structure, floor plans, curriculum, syllabus, and lecture tools at SMAN Bukit Sundi, Solok Regency.

The validity of the data obtained in the field was checked using reliable and accountable techniques. The informants were teachers in charge of the biology course and several students who participated in the interview to be asked about the teaching and learning process in biology subject on viruses. The researchers carried out reliability techniques, namely: a) perseverance in observation to determine the characteristics and elements in situations that are genuinely relevant to the problem; b) triangulation is a technique of examining data that utilizes something outside the data done by checking the degree of trust through several data sources using the same interview method; c) examination of colleagues through discussion. The following

technique was in the same positivistic paradigm as reliability. It determined whether or not research results can be replicated or retested, bearing in mind that studies with a positive paradigm view that reality is directly related to the context of time. It is not possible to replicate the study results.

The data analysis technique used in this research was the interactive model. The technique started from the data reduction processes: selecting, simplifying, focusing attention, and transforming the raw data obtained in the field notes as a summary of the descriptive data. Furthermore, the presentation of data was carried out by displaying information obtained through data reduction activities. Then, the information obtained was organized according to the focus of the problem. The relevant data was compiled to become information that could be concluded and had a certain meaning. In the verification or drawing conclusions step, the researchers received input data from other researchers until the data collection was declared ended. Furthermore, the researchers described and explained the learning activities on viral material, including lesson planning, learning processes, and assessment of learning outcomes on viral material. This research aimed to reveal the implementation of Biology learning on virus material at SMAN I Bukit Sundi.

RESULTS AND DISCUSSION

This research was conducted at SMAN Bukit Sundi, Solok Regency. Based on the results of observations, interviews with biology teachers and several students who took part in learning as informants, and documentation, the following data are presented:

Table 2. Average Value of Biology Subject in The Tenth Grade of Senior High School

Material	Hours	Semester	Average
Viruses	2	1	75
Protists	4	1	74
Fungi	2	1	76
Total Score			75

The table shows that the average value obtained was 75 in the high category. Based on these findings, it was observed that the teacher's pedagogical abilities were in a good range. The academic knowledge could be identified by reflecting on the teacher's pedagogic knowledge captured from the specific context of pedagogic knowledge, including knowledge about curriculum, evaluation, and learning objectives. This pedagogic ability can be obtained by teachers when they are in college and also from the training process carried out during lectures. Based on literary sources from research findings (Rusilowati & Wahyudi, 2020), low student learning outcomes are caused by low teacher pedagogic mastery.

Based on the researcher's interview with informant two about the curriculum implementation, the applicable curriculum is the competency-based curriculum. He stated that the curriculum currently implemented in schools is the Competency-Based Curriculum (KBK). The curriculum is a guide for lecturers in carrying out the learning process. In one week, there were 67 hours of lessons. Every day, the learning process starts at 08.00 until 16.00, except for Sunday.

Based on the triangulated observations and interviews, the curriculum applied in the school was the Competency-Based Curriculum. The learning process will be done well if it is supported by teacher planning and preparation before learning begins. It means that if the formulation and preparation of the syllabus and lesson plans are not appropriate, it will affect the learning process that the teacher will carry out (Mulang, 2021). According to Ihsani et al. (2020), syllabi and lesson plans guide teachers to apply subject matter.

The learning process will be carried out well if it is supported by teacher planning and preparation before learning begins (Nurtanto et al., 2021). This concept must refer to all the activities the teacher will carry out in preparing himself before starting and carrying out learning. The preparation must be done first to prepare a syllabus and

learning process plan because they are closely related to the learning process in the classroom (Adiyono et al., 2022). Suppose the formulation and preparation of the syllabus and lesson plans are inappropriate. In that case, the learning process by the teacher will also not be appropriate because the syllabus and lesson plans are guidelines for teachers to apply subject matter. Ramírez-Montoya et al. (2021) argue that professional teachers master knowledge, are experts in their field, and have skills in learning.

An interview was conducted with informant 03 regarding the existence of a biology learning syllabus. He answered that he got the syllabus from the previous biology teacher without revising it. Therefore, the preparation before the learning process was ineffective.From the interview results above, it can be seen that the biology teacher did not have a syllabus. He used the syllabus from the previous teacher. To confirm the information, the researcher triangulated from several informants and documentation. It was concluded that the biology teacher only used the syllabus from the previous teacher. According to Isna & Sari (2020), in practice, teachers and lecturers can carry out syllabus development, learning plans, or syllabi independently or in groups in a forum or other formal educational environment. So, it is better for each teacher, independently or in groups, to develop a syllabus or lesson plan according to what is included in the curriculum. Teachers can be said to be professional and carry out their duties and responsibilities professionally.

Implementation of Lectures

Lecture implementation is a very complex process. One of the main factors in lectures is students. The following is an overview of the implementation of biology learning on viruses at SMAN.

1. Requirements for the Implementation of the Learning Process

a. Learning Group

Based on observations in class X1 and X2, the students per class were 42 students in class X1 and 50 students in X2.

b. Minimum Teacher Workload

Based on observations, the minimum workload for biology teachers is four face-to-face credits in one week. It must follow Permendiknas No. 14 of 2007, in which the teacher's workload is at least 24 hours face-to-face in one week. The teacher's workload includes the main activities: planning lessons, learning, assessing learning outcomes, guiding and training students, and carrying out additional assignments. Each teacher should have at least twelve hours of face-to-face meetings in one week so that the teacher's main activities can be carried out as they should (Krowin & Merentek, 2019).

c. Textbooks

Based on the observations, the average student had a handbook in the form of a handbook. The researcher interviewed the informant, Mrs. Martawilis, a biology teacher, about student handbooks to reinforce the information obtained. She stated that the handbooks used by students were limited to the form of textbooks, and there were no other textbooks. Based on the interviews, the number of textbooks was sufficient, but other sources were not used, so the information obtained was very limited in the school environment. Student learning success depends not only on the environment and learning conditions but also on students' prior knowledge. According to Mamurov et al., (2020), learning involves the formation of meaning by students about the concepts being studied.

Based on observations, interviews, and triangulation, the high number of students attending lectures was rather high and caused inconducive conditions. During the learning process, some students were not disciplined and disrupted the learning process. The available resource books were limited, so students were less active in asking questions.

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The implementation of learning takes place in a certain atmosphere. There are interrelated factors, ranging from lecture objectives, students, teachers, teaching materials, learning methods, teaching aids, assessment procedures, and teaching situations (Ruzikulovich & Uzbekistan, 2019). In the learning process, all factors move dynamically in a series that is directed to bring students to achieve learning goals. Tempelaar et al. (2021) argue that the implementation of learning is the operationalization of learning planning so that it cannot be separated from the learning planning that has been made. Therefore, in practice, it will depend on how the lesson plan is as an operationalization of a curriculum. Besides, the implementation of learning also includes preliminary activities, core activities, and closing activities.

Assessment of Learning Outcomes

According to Permendiknas No. 14 of 2007, the instructor assesses to determine the level of attainment of student competency, and it is utilized as material for creating progress reports on learning outcomes and enhancing the learning process. Evaluation is carried out consistently, organized, and planned, employing written and spoken tests and non-tests, performance observation, attitude measurement, and work evaluation in the form of assignments, projects, products, portfolios, and self-assessments.

Educational Assessment Standards and Subject Group Assessment Guidelines assess learning outcomes. Based on the findings, it is possible to conclude that low student learning outcomes are caused not just by the teacher but also by a lack of student preparedness in learning and a lack of students' motivation and willingness to learn. Parents are another essential component in students' performance. The main cause of low student learning outcomes is a lack of parental attention to student learning because pupils have more time to repeat lectures at home or in boarding houses than they do at school (Mamurov et al., 2020).

Obstacles to the Implementation of Biology Learning in High School on Virus Learning Material

Many challenges were encountered while applying biology lessons on viruses in high school. Many problems were found in integrating biology learning on viruses, as described in the previous specific findings. However, in general, these constraints can be divided into numerous categories, as shown below:

a. Lack of Teacher Pedagogic Competence

The following findings reveal the following issues: (1) Teachers have not produced syllabuses or lesson plans suited to the setting and situation of the school where the learning process occurs. (2) The instructor does not grasp the application of the learning device document since it is not the teacher's work. (3) Teachers have not been able to efficiently manage their time. (4) Teachers have been unable to provide adequate educational media. Wen et al. (2020) argue that intensive training is needed in learning processing and school context analysis training to overcome these obstacles. Understanding the fundamentals of education, understanding students, developing a syllabus, designing lesson plans, educational learning processes, utilizing learning technology, assessing learning outcomes, and developing students to realize their full potential are all part of learning processing training.

The campus context analysis is related to the National Education Standards in Government Regulation No. 18 of 2007, specifically graduation competency standards, content standards, process standards, education and education staff standards, facilities and infrastructure standards, processing standards, financing standards, and assessment standards. As a result, we can conclude that when compiling learning tools, we must be guided by the

findings of the school context analysis (Saptenno et al., 2019).

CONCLUSIONS AND SUGGESTIONS

Based on the research findings, it is possible to conclude that teachers do not arrange contextual learning independently based on the campus context where the learning occurs. Teachers carry out learning that is not yet effective and efficient because (a) teachers have not been able to use time effectively; (b) teachers have not been able to determine and choose appropriate learning media following the criteria of learning materials; and (c) learning has not been effective and efficient due to a lack of laboratory equipment in quantity and quality. The teacher assessed student learning outcomes, but the mechanisms and procedures used were ineffective.

Based on the findings of observations, interviews, and documentation studies of all data obtained, several factors contribute to student's lack of understanding, including the learning method used is still ineffective, the teacher's use of time being inefficient, the teacher has not mastered the material well, a lack of intention, interest, and students' desire to learn, a lack of student handbooks, and a lack of motivation from the teacher. Some solutions for overcoming the factors mentioned above include the teacher designing the implementation of learning.

Based on the research findings, several recommendations can be made, including learning and planning should be made by lecturers themselves and submitted to Permendiknas No. 41 of 2007 concerning process standards, both in terms of format and content and the context of the school where the learning is carried out. Learning implementation should follow the learning activities listed in the lesson plans that have been designed. The Psychomotor and the teacher should create a grid of questions that refer to achievement indicators and group these questions based on the level of the realm to be assessed so that learning outcomes are assessed following Permendiknas No. 41 of 2007 regarding process standards.

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