

An Analysis of Student Pedagogical Skills in Applying Mathematics Learning in Elementary Schools

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ARTICLE INFO

Keywords:

Pedagogic skills;
Students;
Mathematics;
Learning;
Elementary school

Article history:

Received 2021-12-11

Revised 2022-02-02

Accepted 2022-05-28

ABSTRACT

The purpose of this study is to describe the pedagogical skills of students in applying mathematics learning in elementary schools. The pedagogical skills studied focused on skills in making lesson plans and implementing learning. The method used was descriptive quantitative research method. The research sample used was 13 students of the 5th semester elementary school teacher education study program. The results showed that the students' pedagogical skills were in the good category with an average score of 81.11%. Recommendations that can be given are the need for students to be accompanied on an ongoing basis starting from the stage of making lesson plans, implementation, to evaluation when the implementation of mathematics learning is simulated in the classroom.

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1. INTRODUCTION

This research is motivated by the fact that the students of primary education study program are not yet skilled in making lesson plans and seem to have difficulty implementing a lesson in class. Student have not utilized their writing skills in the integrated learning courses they teach, even though writing exercises can directly improve one's pedagogical skills (Inayah, 2016). This is, of course, a concern because these two skills are basic skills for students of education study programs. If it is ignored, it is not impossible to affect their pedagogical skills in the future. The low pedagogical skills of these students are influenced by the use of an inappropriate learning model, where the lecturer only lectures and does not implement the exercises directly. Lecturers are still dominant in delivering material using conventional methods.

The learning model of writing lesson plans is directly effective in terms of pedagogical skills in terms of writing lesson plans. Writing lesson plans is believed to improve skills in implementing a lesson in the classroom. Conventional methods are not effective in terms of students' pedagogical skills. Writing a direct lesson plan and implementing it in a simulated situation in the classroom is more effective than the conventional method in terms of pedagogic skills because these pedagogic skills require continuous practice (Dewanti, 2012).

The research conducted by Turmuzi & Wahidaturrahmi (2021) examines the pedagogical competencies of education students in implementing the 2013 curriculum. The research focuses on both competencies, which are quite broad, with results showing that the pedagogical competencies of students are in the good category with a score of 85.11. The pedagogical competence with the highest score is the indicator determining the method. The learning approach is in the good category with a value of 88.94. Professional competence with the highest score is on the hands for selecting materials and learning resources. Moreover, another research with approximately the same variables was also carried out by Tantu & Christi (2020) that examines the implementation of learning only but ignores how the lesson plans are made. There is an assumption that if you make a good learning implementation plan, then the learning implementation will also be good. The results of his research show that microteaching exercises can improve students' pedagogic skills in applying learning in the classroom.

Two previous studies show how crucial hands-on practice is for students' pedagogical skills. The results of the two studies are in line. However, what has attracted the attention of researchers is the lack of research on the use of direct writing learning models that specifically focus on the skills of writing student learning implementation plans. No articles discuss direct writing learning models that analyze how students apply them to classroom learning. Several articles that discuss non-specific student pedagogical skills use the learning model to write lesson plans and apply knowledge in the classroom.

In addition, the differences in the pedagogic skills were the focus of the research. It did not only end there, but also the indicators of the pedagogic skills of the students studied differed from what the researchers would do. Of these articles, there are no research articles that discuss about students' pedagogical skills in applying mathematics learning in elementary schools and students' pedagogical skills in writing lesson plans and implementing them in the classroom. For these reasons, it is needed to analyze students' pedagogic skills by applying mathematics learning in elementary schools with a novelty analyzing every pedagogical skill indicator observed in the lesson plans and analyzing the learning carried out by students during simulations in class.

Taking those into account, it is necessary to analyze the pedagogical skills of students in applying mathematics learning in elementary school. The formulation of the research problem in the article: How are the pedagogic skills of students in applying mathematics learning in elementary school? The aim is to describe the pedagogic skills of students in applying mathematics learning in elementary schools.

2. METHODS

This research uses a descriptive method with a quantitative approach. Descriptive through quantitative aims to determine the pedagogic skills of students at the end of integrated learning lectures. Pedagogic skills in this study focused on students' skills in making lesson plans and implementing learning. A quantitative approach is used because research on pedagogic skills is analyzed in the form of scores and percentages (Turmuzi & Wahidaturrahmi, 2021). This research is then described according to predetermined categories.

The research was conducted for four months. The population is all students of the 5th-semester basic education study program, Faculty of Education, Universitas Pahlawan Tuanku Tambusai, totaling 42 students. The research sample used was 13 students—data collection techniques in documentation and observation. Documentation is done through the assessment sheet of the learning implementation plan, and observations are made through the learning observation sheet.

The instruments are lesson plans, analysis sheets, and learning observation sheets. Analysis of the data used using the Guttman scale with assessment techniques of 1 and 0. A value of 1 is given if Yes, and 0 is assigned if No. Furthermore, the data that has been collected is analyzed using percentages and categorized based on the following values:

Table 1. Criteria of Student Pedagogic Skills

Percentage (%)	Category	Code
85 – 100	Very good	AB
70 – 84	Good	B
55 – 69	Enough	C
45 – 54	Fair	K
0 – 44	Poor	AK

The research steps are described in the following scheme:

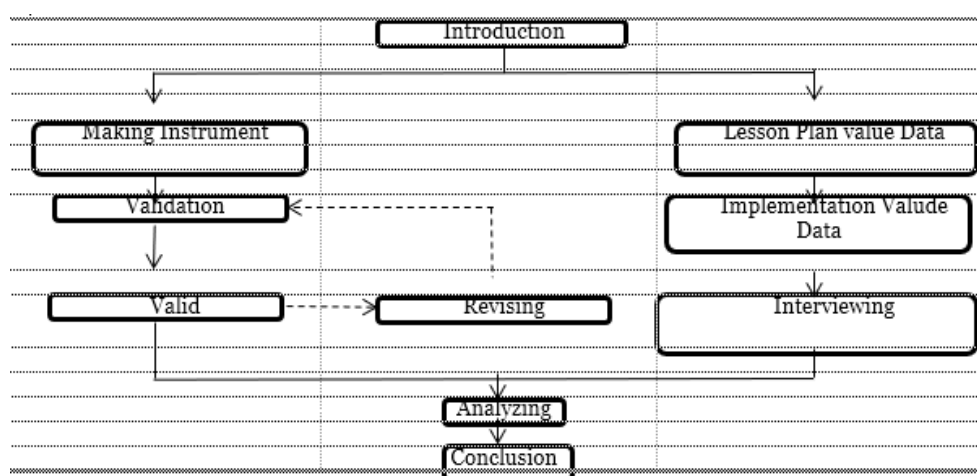


Figure 1. Research Procedure

3. FINDINGS AND DISCUSSION

Student Pedagogic Skills in Making Lesson Plans

Student pedagogic skills in making lesson plans:

Table 2. Student pedagogic skills in making lesson plans

No.	Student Code	Score	Category
1	ZA	82	B
2	QI	82	B
3	RO	84	B
4	SN	83	B
5	YP	82	B
6	MH	80	B
7	MA	82	B
8	EY	80	B
9	AF	80	B
10	PR	78	B
11	MS	78	B
12	SY	75	B
13	RN	75	B
Mean		80,07	B

Source: Research processed data, 2021.

In general, students' pedagogic skills in making lesson plans are in a good category (80.07%). If analyzed in detail one by one, the most prominent weakness in writing this lesson plan is that the syntax of the learning model written by students is not detailed, even though the syntax of the learning model is essential to write so that anyone who will teach in the class can implement their learning. The importance of writing learning model syntax in lesson plans was also expressed by (Inayah, 2016), who in his article revealed that there are nine aspects in assessing students' pedagogic skills in making lesson plans, namely identity, indicators, formulation of learning objectives, teaching materials, sources, media, learning methods, scenarios, and evaluation plans.

They determine the themes and sub-themes that they consider mastered. When writing indicator formulations, students began to encounter difficulties. The difficulty is in determining the number of indicators to be achieved. On average, students write down many category without considering the time allocation and without thinking about the essential competencies that have been previously selected. This is quite inconvenient for the assessors because the writing of the indicator formulation also does not follow the basic competencies that have been set. The suitability of the essential competencies and the formulation of the indicators chosen is one aspect of the assessment in assessing the RPP as expressed by (Dewanti, S., 2012), which explains that the elements of lesson plan's assessment: completeness of the lesson plan, suitability of objectives, and competency standards, essential competencies and indicators, suitability of materials and use of methods, strategies, and media as well as objectives and characteristics of materials, design of steps, suitability of assessments and indicators, types of bills, forms of instruments, suitability of learning resources and characteristics of materials.

Writing the formulation of learning objectives also experienced difficulties. Almost all students formulated learning objectives without paying attention to the elements of Audience, Behavior, Condition, and Degree (ABCD). Some students did not know about ABCD in writing these learning objectives. The researcher was confused by this condition because the students studied were 5th-semester students. The researchers forced this condition was forced to be understood by the researchers and began to explain the importance of the ABCD element in formulating learning objectives. Writing the formulation of learning objectives by taking into account the ABCD elements is believed to increase creativity and improve pedagogic skills. (Judiani, 2011)(Witarsa & Dista, D., 2019).

The selection of teaching materials made by students did not encounter significant obstacles. All students can be said to have a good skills in this regard. This study is the same as the results of the study (Bahari, 2020) in that three indicators show that prospective teachers have good knowledge of material selection. However, when making indicators and choosing learning models, future teacher students still have difficulties, requiring continuous practice. Students' choice of learning media also did not encounter significant obstacles. All students can choose the appropriate learning media. This study is the same as the results of the study (Taufikurrahman & Nurhaswinda, 2021) that the use of media can improve understanding of mathematical concepts in the learning carried out.

Student Pedagogical Skills in Applying Mathematics Learning

Student pedagogic skills in applying mathematics learning in elementary school:

Table 3. Students' pedagogical skills in applying mathematics learning

No.	Student Code	Score	Category
1	ZA	86	AB
2	QI	86	AB
3	RO	86	AB
4	SN	84	B
5	YP	84	B
6	MH	82	B
7	MA	82	B

No.	Student Code	Score	Category
8	EY	82	B
9	AF	80	B
10	PR	80	B
11	MS	80	B
12	SY	78	B
13	RN	78	B
	Mean	82,15	B

Source: Research processed data, 2021.

In general, students' pedagogic skills in applying mathematics learning are in a good category (82.15%). This increase was caused by the spontaneity that occurred when applying mathematics learning in the classroom. Almost all students still see their lesson plans when applying mathematics teaching in class. Some students also carried out several positive activities beyond their lesson plans. Positive things outside the RPP that have been made occur at the core activity stage. There are fluctuations of increase and decrease when learning is carried out. This result is the same as that expressed by (Tantu & Christi, 2020), which shows an increase in the percentage from preliminary to core activities. Still, there is a decrease in the rate from core to closing activities.

All students apply the syntax of the learning model that has been written in the lesson plans that have been made previously. Almost all students use the PBL model. The PBL model syntaxes are used differently according to the experts they refer to, respectively. The application of learning model syntaxes also pays attention to professional style and body movements because the appropriate style and body movement will affect student learning in the classroom (Antari & Sujana, 2021). The application of good style and body movements following the conditions and characteristics of students will, of course, improve students' pedagogic skills in implementing their lesson plans in the classroom.

Another difficulty that appears when implementing mathematics learning in the classroom is the application of PBL. Students seem difficult. This study is the same as the study results (Tyas, 2017) that the difficulty of prospective teachers in making PBL lesson plans is when determining problems that can stimulate students' knowledge well. Another difficulty when implementing PBL takes a long time. This long time must be managed by the teacher wisely. Student discussions in PBL also need special attention because it is not impossible that the problems which are brought up can backfire for the teacher. It should note that the problem raised must be a problem felt by the students (Ali, N. et al., 2021).

Students' Pedagogic Skills in Making Lesson Plans and Applying Mathematics Learning

Student pedagogic skills in making lesson plans and applying mathematics learning:

Table 4. Recapitulation of student pedagogical skills in making lesson plans and applying mathematics learning

No.	Student Code	Score of Lesson Plan (%)	Score of Learning Implementation (%)	Mean (%)	Category
1	ZA	82	86	84	B
2	QI	82	86	84	B
3	RO	84	86	85	AB
4	SN	83	84	83,5	B
5	YP	82	84	83	B
6	MH	80	82	81	B
7	MA	82	82	82	B

No.	Student Code	Score of Lesson Plan (%)	Score of Learning Implementation (%)	Mean (%)	Category
8	EY	80	82	81	B
9	AF	80	80	80	B
10	PR	78	80	79	B
11	MS	78	80	79	B
12	SY	75	78	76,5	B
13	RN	75	78	76,5	B
Mean		80,07	82,15	81,11	B

Source: Research processed data, 2021.

The pedagogic skills of students in making lesson plans and applying mathematics learning are in a good category (81.11%). One student is in the Very Good (VG) category (RO code student). This is not surprising because these students are active in attending lectures. This student's potential has been seen since he was in his early semester. His pedagogical skills were honed because RO students took part in training to increase pedagogic competence held by the local government (Witarsa et al., 2020). This student is already in the field by becoming an early childhood education teacher. These results align with research results (Rosa, 2016) that training programs can maintain and improve pedagogic competence. Students with RO codes also have impressive academic achievement scores. So, it is not surprising that his pedagogical skills are above average and slightly above his fellow students. Academic achievement significantly affects the pedagogic skills possessed by prospective teacher students (Syawahid & Pardi, 2016).

The other 12 students were in a good category. This is not surprising because these 12 students still have minimal flight hours to implement learning in class. Almost all students are still lacking in good classroom management. The way of learning that still looks stiff and awkward is still visible in them. This result is linear with the research results (Dirgantoro, 2020) that prospective teachers can do well in learning, but the class management is still minimal. Teaching flight hours need continuous practice to manage the class professionally. The reluctance of prospective teacher-students is another problem that needs to be faced. Psychological factors that make prospective teachers reluctant to be seen when teaching in class need special strategies, so that prospective teachers do not feel down when their learning does not meet expectations. The basic skills of managing the class must be trained continuously. If you don't use a knife, it will become dull over time. Likewise, if you rarely appear in front of students, class management skills will eventually disappear (Asdar, 2017). These difficulties can be overcome by focusing on improving the pedagogical skills of prospective teachers; as stated (Handayani, 2014) prospective teachers must pass the training step by step. Time and experience in front of students will determine whether someone is professional or not in teaching in elementary schools. The primary key is practice, do it, and keep doing it, don't be against an input. Practice makes perfection.

4. CONCLUSION

Students' pedagogic skills in applying mathematics learning in elementary school are in a good category (81.11%). Students need to be assisted on an ongoing basis, starting from making lesson plans implementation to evaluation when mathematics learning is simulated in the classroom. Although conducting learning simulations is good, it is necessary to manage the class professionally. Professionally managing the class can be done by adding flight hours and experience in class. It is time for fifth-semester students to go down to elementary school as honorary teachers to increase

their ability to manage classes. The more you teach, the better your class management skills will be. Further research is needed on the professional competence of prospective teachers in other learning.

REFERENCES

- Ali, N., A., Takaria, J., & Pattimukay, N. (2021). Pengaruh Model Pembelajaran Treffinger terhadap Hasil Belajar Siswa pada Materi Bangun Datar Kelas IV MI Salman Al-Farisi Liang. *Pedagogika: Jurnal Pedagogik Dan Dinamika Pendidikan*, 9(1), 27–34.
- Antari, N., K., Y., & Sujana, I., W. (2021). Kontribusi Kompetensi Pedagogik dan Profesional dengan Keterampilan Penerapan Gestur Guru dalam Pelaksanaan Pembelajaran. *Jurnal Mimbar PGSD Undiksha*, 9(1), 93–103.
- Asdar, A. (2017). Kompetensi Pedagogik Guru Matematika SMP di Kabupaten Buol Sulawesi Tengah dalam Mengimplementasi Kurikulum 2013. *Phytagoras: Jurnal Pendidikan Matematika*, 12(2), 187–199.
- Bahari. (2020). Pedagogical Knowledge : Analisis Kemampuan Pedagogik Guru IPS dalam Merancang Pembelajaran. *Indonesian Journal of Social Science Education (IJSSE)*, 2(1), 33–39.
- Dewanti, S., S. (2012). Analisis Kesiapan Mahasiswa Program Studi Pendidikan Matematika sebagai Calon Pendidik Profesional. *Seminar Nasional Pendidikan Matematika*, 17–27.
- Dirgantoro, K., P., S. (2020). Analisis Kinerja Mahasiswa Pendidikan Matematika dalam Pengajaran Mikro Sekolah Dasar. *Fibonacci: Jurnal Pendidikan Matematika Dan Matematika*, 6(1), 17–26.
- Handayani, S. (2014). Peningkatan Kompetensi Pedagogik Guru IPS Sekolah Dasar melalui Penerapan Keterampilan Mengajar. *Jurnal Ilmu Pendidikan Sekolah Dasar*, 2(1), 1–15.
- Inayah, S. (2016). Analisis Kompetensi Pedagogik Mahasiswa pada Mata Kuliah Program Latihan Profesi I (PLP I). *Jurnal Handayani*, 5(2), 1–12.
- Judiani, S. (2011). Kreativitas dan Kompetensi Guru Sekolah Dasar. *Jurnal Pendidikan Dan Kebudayaan*, 17(1), 56–69.
- Rosa, N. (2016). Penerapan Program In House Training dalam Meningkatkan Kompetensi Pedagogik Guru Pendidikan Anak Usia Dini. *Jurnal Pedagogik Pendidikan Dasar*, 4(1), 128–134.
- Syawahid, M., & Pardi, M., H., H. (2016). Studi Prestasi Akademik dan Kemampuan Pedagogik Mahasiswa Calon Guru Matematika. *Jurnal Gantang Pendidikan Matematika FKIP Umrah*, 1(2), 1–14.
- Tantu, Y., R., P., & Christi, L., Y. (2020). Analisis Pelaksanaan Microteaching Mahasiswa PGSD pada Mata Kuliah PSAP Sains Dan Teknologi. *Jurnal Basicedu*, 4(3), 707–715.
- Taufikurrahman, & Nurhaswinda. (2021). Penggunaan Media Pembelajaran Papan Pecahan untuk Meningkatkan Pemahaman Konsep Matematika Pada Siswa Sekolah Dasar. *Jurnal Pendidikan Dan Konseling*, 3(1), 1–6.
- Turmuzi, M., & Wahidaturrahmi. (2021). Analisis Kompetensi Profesional dan Pedagogik Mahasiswa Pendidikan Matematika dalam Implementasi Kurikulum 2013. *Edukatif: Jurnal Ilmu Pendidikan*, 3(2), 341–354.
- Tyas, R. (2017). Kesulitan Penerapan Problem Based Learning dalam Pembelajaran Matematika. *Jurnal Tecnoscienza*, 2(1), 43–52.
- Witarsa, R., & Dista, D., X. (2019). Analisis Jawaban Siswa Usia 6 sampai 8 tahun terhadap Pembelajaran Sains Kreatif. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 4(1), 58–66. <https://doi.org/10.31004/obsesi.v4i1.288>
- Witarsa, R., Fadhilaturrahmi, & Rizal, M., S. (2020). Penyuluhan Asupan Nutrisi Kacang Kedelai terhadap Lemak Perut Masyarakat Desa Ridan Permai. *Communnity Development Journal*, 1(3), 452–458.

