Wahdatul Ulum Integrated Pedagogical Competence: Analysis in Pre-service Biology Teacher

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Abstract: This study aims to know the integrated pedagogical competence of wahdatul ulum in pre-service biology teacher. The measured pedagogical competence indicators focused on the design and implementation of learning. It can be seen from the ability of students to develop wahdatul ulum-based learning scenarios and its implementation. This study used a descriptive qualitative research method using learning scenario assessment sheet and observation sheet on the implementation of learning scenarios as data collection instruments. Participants were 4th semester of biology education students who take biology learning strategy courses. 12 participants were selected by purposive sampling. The data obtained were then analyzed descriptively. The results showed that pre-service biology teacher students were able to create an excellent learning scenario covering aspects of the completeness of the learning scenario components, the suitability of the subject name, the selection of learning models, the formulation of learning activities, and language. The suitability of learning objectives and wahdatul ulum aspects were classified as good. There needs to be an emphasis to put the learning objectives in learning scenarios so that the learning outcomes are clear. The meaning of the verses of the Qur'an regarding the material also needs to be explained to support the integration of wahdatul ulum in learning. In the implementation of learning, each stage of the preliminary activity, core activity, and closing activity was carried out very well, according to the learning scenario that had been made. The implication of this research is that there is a need for strengthening of a comprehensive understanding in the delivery of material on learning strategies and planning for biology course.

Keywords: Initial teacher education; Learning scenario; Pedagogical competence; Wahdatul ulum

Introduction

Education is something that affects the survival of a nation. It is a facility that allows students to enter the real world that is constantly evolving. Development of the quality of learning is needed, especially in the era of globalization. This is in accordance with Law Number 14 of 2005 concerning Teachers and Lecturers, as well as Ministerial Regulation Number 17 of 2007 concerning Teacher Qualifications and Qualifications (Kurniawan et al., 2020).

Fernandez (2014) states that teachers have a knowledge base and a set of skills that are developed during their teaching activities. Teachers have a role in managing the class and can produce meaningful learning for students (Kasi, 2022). One of the abilities that teachers must have is pedagogical competence.

According to Fakhrutdinova (2020), pedagogic competence is defined as an integral manifestation of the teacher's personality qualities, which combines elements of professionalism and general culture, experience of pedagogic activities and creativity. This competency refers to the specific knowledge or competence of teachers who are able to direct the educational process or teaching and learning relationships with students. This makes pedagogic competence a special competency that distinguishes teachers from other professions which shows the teacher's ability to organize learning material so that it can be easily understood by students and achieve learning goals (Firman et al., 2019).

Pedagogic competence can be seen from learning scenarios and their implementation. Preparing learning scenarios is a way to plan teaching activities, encouraging the development of skills related to

problem solving, collaboration, critical thinking and creativity (Pedro et al., 2019). Tetchueng et al. (2008) argue that learning scenarios describe learning activities to acquire domain knowledge and knowledge to solve certain problems.

For teachers, the conceptualization of learning scenarios is a starting point for expressing innovative ways of thinking about teaching and learning. The use of learning scenarios as a structured resource to stimulate students and teachers in student teacher candidates is based on the idea that scenario planning is a powerful tool that allows teachers to break away from didactic sequences and reconstruct appropriate ways to teach (Pedro et al., 2019). The design and implementation of learning scenarios has an intrinsically reflective nature, which encourages understanding of the implications of the decisions made (Silva et al., 2021). As such, it can contribute to the professional development and identity of teachers (Carroll, 2000).

Skills in making learning scenarios by prospective teachers are formed through education in educational institutions and education staff. This is a key factor in the professionalism of educators or prospective teachers. This institution is designed as a place to present qualified teacher candidates who are ready to compete in society.

Islamic religious tertiary institutions are a form of educational institution and educational staff that supervise prospective teachers who not only have general education qualifications, but also in the religious field. This is reinforced by the Decree of the Directorate General of Education No. 102 of 2019 concerning Standards for Islamic Religious Higher Education which notes that planning, implementation and reporting of research activities at Islamic religious tertiary institutions must be measurable, directed and planned by referring to national tertiary standards and paying attention to aspects of the integration of Islamic knowledge and studies. This aims to realize an increase in the quality of learning and optimization of higher education tridharma (Fauzi, 2016).

One of the efforts that can be made is to integrate Islamic concepts in every scientific field studied in tertiary institutions, for example the concept of wahdatul ulum (unity of science). Wahdatul ulum is a unity of knowledge (wahdah means one or unity and ulum means information/knowledge). There is no longer the concept of religious knowledge and general science which is just the name Ulumud-Diniyah for religious and Islamic knowledge for the general public. Interdisciplinary is one perspective that deserves to be accepted as an extension of the wahdatul ulum paradigm. The interdisciplinary approach to the nature of the knowledge produced does not stop at theoretical knowledge, but also transformative knowledge (Ritonga, 2022).

One field of study that applies interdisciplinary is Biology. Biology is the science of life concerning living things which of course examines the surrounding environment both humans, plants and animals that have attachments to other scientific fields, including its integration with the concept of wahdatul ulum. Integrated Biological Sciences wahdatul ulum can be realized through an interdisciplinary approach, such as linking the verses of the Quranic Qur'an to the subject matter in order to deepen and strengthen the resulting understanding. Observing surrounding natural phenomena is an inspirational activity related to the development of research in Biology (Amri et al., 2017). Therefore, this study aims to determine the integrated pedagogic competence of wahdatul ulum prospective Biology teachers in the Tadris Biology study program, Faculty of Tarbiyah and Teaching Sciences, State Islamic University of North Sumatra Medan.

Method

This research was conducted from April to June 2022 at the State Islamic University of North Sumatra, Medan. The research subjects were 12 people of 4th semester students of the Tadris Biology study program who took the Biology Learning Strategy course. Respondent samples were taken by purposive sampling to avoid data saturation. Purposive sampling was carried out by selecting samples that were considered to be representative of the population being studied (Gay et al., 2012). This research uses descriptive qualitative method. The data presented are obtained from the results of the analysis of learning scenarios and the implementation of learning scenarios that have been formulated.

The research instruments were assessment questionnaires and observation sheets. Assessment questionnaires and observation sheets use a Likert scale of 1-4 with assessment categories in Table 1.

Table 1. Rating Scale Categories

Score	Category
1	Not good
2	Less good
3	Good
4	Very good

The aspects assessed in the questionnaire included the completeness of the learning scenario components, the suitability of subjects/materials, the suitability of basic competencies/indicators/learning objectives, the selection of learning models, the formulation of learning activities, language, and wahdatul ulum. The data obtained from the learning scenario assessment

questionnaire was converted into quantitative values and then analyzed descriptively. Descriptive analysis was carried out by categorizing the results of the assessment with categories as listed in Table 2.

Table 2. Category Percentage of Student Scenario Writing Skills

Average value (%)	Category
< 60	Less
60-70	Enough
71-80	Good
> 80	Very good

Then, the data is analyzed through the stages of data reduction, data presentation, conclusion and verification of data that has been arranged in such a way (patterned, focused, and systematically arranged) after that it is concluded so that the meaning of the data is obtained.

Results and Discussion

To obtain research data, instruments were used in the form of learning scenario assessment sheets and observation sheets for the implementation of learning scenarios. Assessment of learning scenarios is based on several aspects with the results shown in Figure 1.

Components in the learning scenario consist of subjects/materials, basic competencies/indicators/

learning objectives, and learning activities. Based on the results of the assessment in Figure 1, prospective teacher students generally make learning scenarios with complete components and are classified as very good. Even so, there are student teacher candidates who do not include basic competencies or learning objectives in their learning scenarios. Furthermore, researchers obtained data related to the results of the assessment of learning activities which are presented in Figure 2.

Based on the interpretation in Figure 2 that as a whole, the completeness of the components of learning activities in the form of preliminary activities, core activities, and closing activities are fulfilled in each learning scenario made by prospective teacher students. Each stage of activity is accompanied by a time allocation. In the closing activity, in general the conclusions have been conveyed well. However, not all students included reflection and follow-up activities. Even though reflection and follow-up are important things that can be material for improvement for student teacher candidates in carrying out learning.
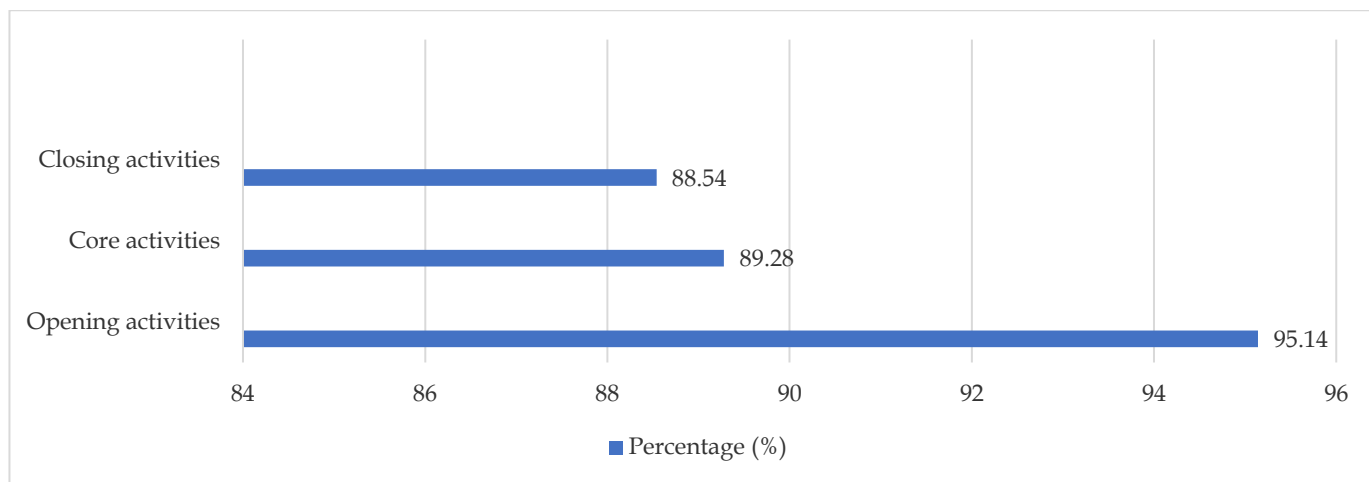
After obtaining data related to the assessment of learning activities, the researcher obtained data related to the overall assessment of the learning scenarios that had been prepared by student teacher candidates. The data is presented in Figure 3.
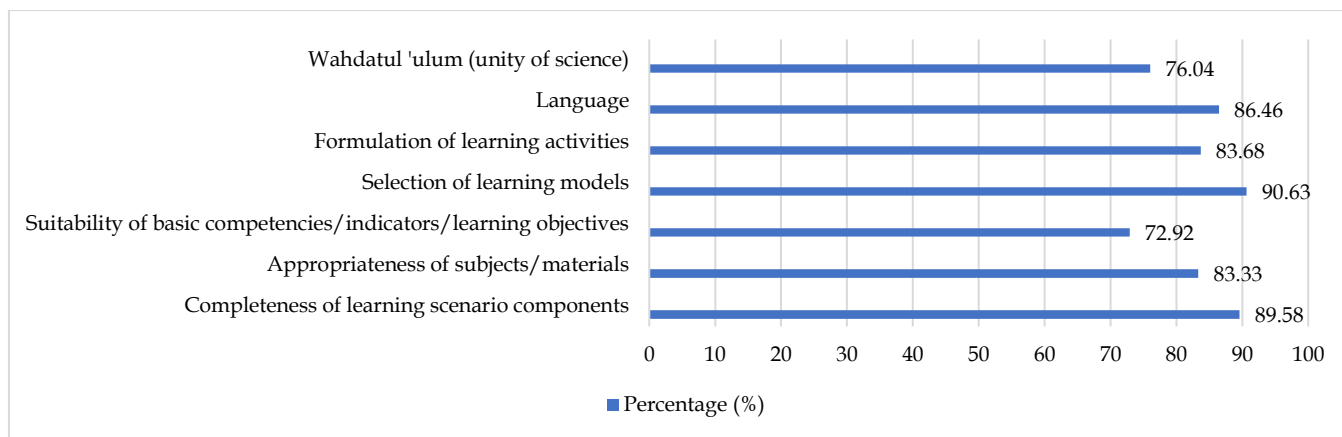
Figure 1. Results of the learning scenario assessment
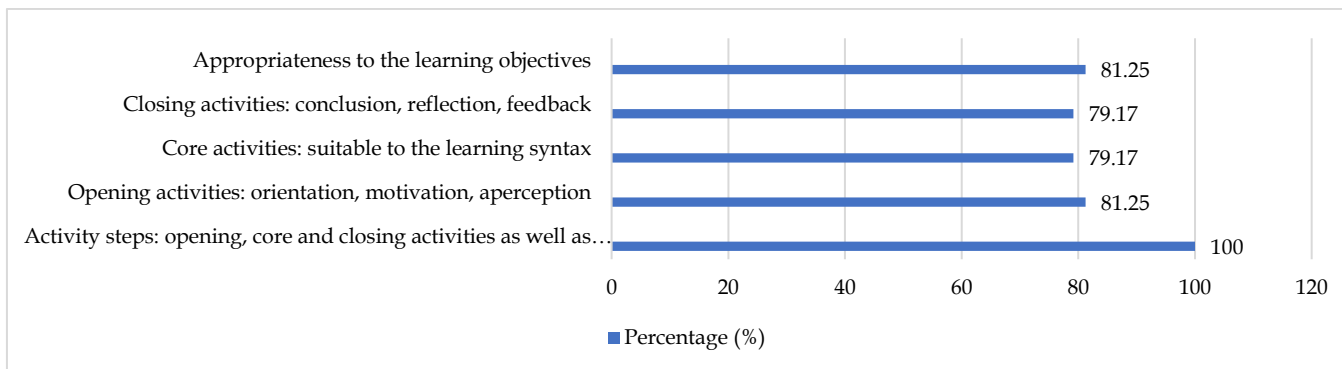
Figure 2. Results of assessment of learning activities

Figure 3. Results of the assessment of the implementation of learning scenarios

Figure 3 implies that as a whole, student teacher candidates can implement the stages in this preliminary activity very well. In the preliminary activity, a score of 95.14% was obtained, which means that students carried out learning activities very well, students gave apperceptions, conveyed learning objectives so as to facilitate students' understanding of the output and nature of the learning discussed. In the core activities, there is a value of 89.28% meaning that almost all indicators in the learning scenario have been implemented very well, especially in mastering material concepts and implementing active learning. Learning syntax that has been prepared by students can also be carried out systematically. However, not all implementation of learning goes according to the learning plan. It should be noted that it is necessary to re-check the syntax that has been made and understand each of its stages. Whereas in the closing activity, the result of 89.28% implies that the activity was carried out well, including concluding the subject matter and providing reflection and follow-up to the next meeting.

According to Law no. 14 of 2005, teachers must have four competencies, including pedagogical qualifications. Pedagogic competence includes teacher's understanding of students, planning and delivery of learning, evaluating learning outcomes, and developing students to realize their various opportunities (Rosni, 2021). In this study the measured pedagogic competency indicators focused on the design and implementation of learning. The analysis of the data obtained is related to the suitability of the learning scenarios prepared by students on the rating scale which is interpreted through the percentage of skills in compiling learning scenarios.

Learning Scenario Aspects
Completeness of learning scenario components
The learning scenario component includes several aspects, including subjects/materials, basic competencies/indicators/learning objectives, and learning activities. The learning component in the learning scenario is relatively simpler compared to the lesson plan. Learning scenarios emphasize more on the learning activities carried out. As a result, prospective biology teacher students pay less attention to other components of learning scenarios and focus more on learning activities. Aufa et al. (2014) argues that the scope of lesson plans made by teachers is generally consistent with the standards set by the government.

Appropriateness of subjects/materials
The evaluation results explained that the names of the subjects and the material contained in the learning scenarios were in accordance with the curriculum structure that applies to educational units. In this aspect obtained very good qualifications. Even so, there are student teacher candidates who do not include the identity of the subject or material in their learning scenarios. This may be caused by the creation of scenarios carried out in biology learning strategies courses, so that students assume that the learning scenarios made are definite for biology subjects. Even so, the inclusion of subjects or materials still needs to be done as part of the identity of the learning scenario. Ruys et al. (2012) stated that the urgency of providing opportunities for prospective teachers to optimize their ability to develop learning scenarios before starting a career as a teacher. Thus, when they have graduated from their education, the prospective teacher has professional performance quality so that they play a role in improving the quality of education, both internally and in general (Jemmi, 2013).

Suitability of basic competencies/indicators/learning objectives
The results of the analysis explained that the ability of prospective teacher students to make basic competencies/indicators/learning objectives in learning

scenarios was quite good. Students have included basic competencies relevant to the curriculum documents and learning objectives that are in accordance with these competencies. It's just that, there are still some students who do not include basic competencies/indicators/learning objectives, even though each learning activity must have clear objectives. Moreover, related to formulating learning objectives, students experience difficulties in determining the components of learning objectives, such as Audience, Behavior, Condition, and Degree. This is in line with Wulandari (2019) who argues that prospective teachers still have difficulty formulating learning objectives. This is due to a lack of understanding of the concept of each component of the learning objectives and their relevance to the learning indicators to be achieved.

Selection of learning models

Based on data analysis, it can be understood that students are very good at determining learning models that are relevant to the scientific approach. This is in line with the approach suggested in the 2013 Curriculum. Variations in learning models chosen by students such as inquiry, discovery learning, contextual teaching and learning, and problem based learning also encourage the implementation of learning that can develop 21st century skills (Mardhiyah et al., 2021). The formation of 21st century skills can be a tool that helps students solve problems faced in the global era through collaboration (Domine, 2011). These learning models are also in accordance with the learning objectives in the learning scenarios that have been made.

Formulation of learning activities

Overall, the completeness of the components of learning activities in the form of preliminary activities, core activities, and closing activities have fulfilled each learning scenario made by student teacher candidates. Each stage of activity is accompanied by a time allocation. Time allocation is important for determining the achievement of basic competencies that students will learn (Goldsmith, 2009). Even so, the ability of student teacher candidates in adjusting the syntax of the learning model used is quite good.

There are learning scenarios that are designed systematically and according to the syntax, but there are also learning stages that are not in accordance with the syntax of the learning model used. This requires reinforcement to students regarding the understanding of each stage in the syntax of the chosen learning model. In the closing activity, in general the conclusions have been conveyed well. However, not all students included reflection and follow-up activities. Even though reflection and follow-up are important things that can be

material for improvement for student teacher candidates in carrying out learning.

Language

Assessment of learning scenarios on linguistic aspects has shown very good criteria. Students have used good and correct language that is communicative in nature. Language elements in learning scenarios play an important role in conveying the aims and objectives of learning scenarios so that there are no double interpretations or misconceptions (Adrianto et al., 2020).

Wahdatul Ulum

Wahdatul Ulum is knowledge that really comes from Allah SWT, where humans are given the opportunity to hope in His love and that is actually within the scope of piety to Allah. That is why science has been sitting among Muslims. The presence of Wahdatul Ulum as a scientific paradigm of UIN North Sumatra is essentially an effort to respond to the development of science and technology and the dichotomy of knowledge that exists in tertiary institutions (Fridiyanto, 2019). In this study students were directed to create learning scenarios that were integrated with wahdatul 'ulum. This form of integration can be seen from the inclusion of Qur'anic verses, particularly the Kauniyah verses, which are appropriate to the contextuality of the material and concepts being taught. The results of the assessment on this aspect show that prospective Biology teacher students can integrate wahdatul ulum in learning well.

However, there is still material in learning scenarios that are associated with inaccurate Qur'anic verses. The percentage of assessment on this aspect is quite sufficient in terms of the indicator of the deep meaning of the verses of the Qur'an. The majority of students only include related verses of the Koran, without including an explanation of the meaning of the verses of the Koran in their learning scenarios. On average, prospective teacher students convey the meaning of verses of the Qur'an in learning scenarios at school descriptively in class.

Implementation of Learning Scenarios

One important part that shows the expertise and professionalism of the teacher is the skill of preparing learning scenarios (Tuinamuana, 2011). The learning scenario is assessed as a learning design and a form of teacher readiness to start the learning process. Learning scenarios that have been made are then implemented in schools. Implementation of learning includes preliminary activities, core activities, and closing activities. In the preliminary activities, prospective teacher students can prepare students both physically and mentally. This is also accompanied by giving

motivation to students. Professional teachers can be seen from their good ability to plan detailed and complete learning activities. So that when starting a learning process, the teacher is fully prepared according to the goals he wants to achieve (Ifrianti, 2019). Learning design supports the ability to manage learning as well as theoretical mastery abilities and their application processes in learning. Without this pedagogic competence, of course teachers cannot carry out their profession effectively and optimally (Jayanti et al., 2020).

In the preliminary activities, students have applied apperception in order to facilitate students' understanding to form a complete understanding concept. Students also convey learning objectives to students who are the target of achievement after learning is complete. This is relevant to the learning scenario that has been made. However, there were still some students who did not convey the learning objectives during the preliminary activities. This can cause disorientation for students in understanding the subject matter. Meanwhile, in the core activities, the integration of learning with wahdatul ulum can be carried out very well. Even though the learning scenario only contains verses from the Qur'an, during direct implementation in class, students can explain the meaning of these verses in depth and integrate them into learning properly. In line with the learning syntax chosen by prospective teacher students, the implemented learning supports active and scientific-based learning. This encourages the development of students' 21st century skills (Arslangilay, 2019).

Likewise in the closing activities which were carried out very well, including the provision of conclusions and reflections as well as follow-up to the next meeting. This is in accordance with the learning scenario that has been made. However, there are students who reflect even though these stages are not included in the learning scenario. This is a form of evaluation for prospective teacher students to detail the learning scenarios that have been prepared as a design for conducting learning activities in class. Learning scenarios are a consequence of teachers or prospective teachers who will apply the learning process in order to be able to design a learning process that optimizes the potential of students as a whole and in depth (Yokhebed, 2015). Overall, the application of this learning is in accordance with the scenarios that have been made in the very good category. Learning scenarios have an orientation and support role that has proven useful in the early education of teacher candidates (Pedro et al., 2019).

Conclusion

Based on the research that has been done, it can be concluded that prospective biology teacher students can create excellent learning scenarios covering aspects of the completeness of learning scenario components, suitability of subject/material names, selection of learning models, formulation of learning activities, and language. Aspects of suitability of basic competencies/indicators/learning objectives and wahdatul ulum are classified as good. There needs to be an emphasis on including basic competencies/indicators/learning objectives in learning scenarios so that the final learning outcomes are clearer. The meaning of the Qur'anic verses regarding the material also needs to be explained to support the integration of wahdatul ulum in learning. Students' understanding of lecture materials on learning strategies and biology learning plans needs to be strengthened. It is hoped that further research can analyze more complex issues related to the influence of the integration of wahdatul ulum on student character in biology learning.

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