Perceptions of Science Teachers in Developing Student Learning Outcomes Instruments Online

Syamsul Rizal[1*], Muhammad Azzarkasyi[1], Juli Firmansyah[1], Ibrahim[2]

[1] Physics Education, Faculty of Teacher Training and Education, Universitas Serambi Mekkah, Aceh, Indonesia.
[2] Biology Education, Faculty of Teacher Training and Education, Universitas Serambi Mekkah, Aceh, Indonesia.

Abstract: This study aims to determine the perceptions of science teachers in compiling student learning outcomes instruments online, the obstacles faced by Science Teachers in making student learning outcomes instruments online. This research uses a quantitative approach with a descriptive research type. The sample in this study were 11 teachers of science subjects. Research data collection techniques, through filling out questionnaires, interviews and documentation studies. The results of the study show that the online science learning outcomes instrument at SMA Negeri 6 Banda Aceh has been prepared very well. The teacher's ability to plan an online science learning outcome assessment instrument at SMA Negeri 6 Banda Aceh has been carried out in the very high category. However, some of the obstacles faced by teachers in developing online science learning assessment instruments include: difficulties in carrying out the assessment because it is done online considering that this is the first time this online assessment has been carried out, however, according to the results of interviews, teachers at SMA Negeri 6 Banda Aceh, especially those who teach science subjects, are very motivated because this is a challenge in applying technology in learning; requires a longer time allocation in compiling instruments for assessing student learning outcomes so that it has an impact on the allocation of learning time which is limited and insufficient in conducting student assessments.

Keywords: Instruments; Learning outcomes; Online; Perception

Introduction

Education is a process of human interaction with their environment that takes place consciously and planned in order to develop all their potential, both physical (physical health) and spiritual (thought, intention, work, creativity, and conscience) which creates positive changes that take place continuously in order to achieve his life goals (Ahmadi, 2017; Raj, 2018; Fang et al., 2022). According to the Law of the Republic of Indonesia Number 20 of 2003, education is a conscious and planned effort to develop all the potential of students through the learning process. Three very important parts of education are curriculum, learning process, and assessment. The curriculum is a description of the educational goals that become a reference in the learning process.

Sulistyiadi et al. (2014), Saputra et al. (2016), and Santoso et al. (2017) stated learning is a process that occurs in all people to obtain a change in behavior, knowledge, and skills that includes the cognitive, effective, and psychomotor domains that take place continuously. Furthermore, Trisianawatia et al. (2016), Ismiyatun et al. (2016), Suprihatin (2017), Sumarni (2019), and Wibawa et al. (2019) stated that the learning process is a systematic effort by the teacher to make the learning process run effectively and efficiently starting from planning, implementation, and evaluation. From this definition, it can be concluded that learning is essentially a process in an effort to socialize students with colleagues, teachers, learning resources or facilities and the environment to achieve the goals that have been set. Based on the opinion above, the learning process is a process that is intended so that students can learn

through planning and managing the environment, facilities, and infrastructure that support the realization of learning activities. Assessment is an activity carried out to measure and assess the level of achievement of student learning outcomes and has a very important position in the learning process (Gultom, 2016; Amua-Sekyi, 2016). Evaluation can reflect how far the development or progress of educational outcomes (Suarga, 2019).

Learning outcomes are results obtained by students during the learning process. According Sudjana (2017) states that learning outcomes are the abilities that students have after they receive their learning experience, in a broader sense covering the cognitive, affective, and psychomotor fields. The impact on the learning process during Covid-19 is that all learning activities that were previously carried out face-to-face must now shift to an online (in-network) learning process. According to Moore et al. (2011), Ghifari et al. (2022), Rahmati et al. (2022), Chen (2023), and Abad et al. (2023) states that online learning is learning that uses internet networks with accessibility, connectivity, flexibility, and the ability to produce various types of learning interactions. The obstacles for students of SMA Negeri 6 Banda Aceh during the Covid-19 pandemic were very difficult to participate in learning, especially in science subjects. The learning implementation schedule has been given by each teacher. During the Covid-19 pandemic, student grades also decreased. This is because the teacher cannot assess students objectively and the teacher has difficulty monitoring student activity in learning both affectively and cognitively. According to the IPA subject teacher during the implementation of online learning, the teacher only took an assessment of the activeness, diligence, and discipline of students in participating in online learning.

So far, the delivery of learning material is carried out online through Google Classroom, when students do not understand the material provided, the teacher gives students the opportunity to communicate again through the WA group application. According to Dalyono (2016), Bloom (2017), and Kosilah et al. (2020) explains that the principle of learning outcomes must be based on data that reflects abilities as measured by clear procedures and criteria, not detrimental to students, open, appropriate and systematic assessment in terms of techniques, procedures and results. Furthermore, according to Susanto (2018) states that learning outcomes are student success in learning a number of subject matter expressed in the form of scores from certain test results. Through learning evaluation activities, it can be seen that the achievement of learning outcomes is in accordance with the learning objectives. Based on the opinion above, it can be concluded that learning outcomes are abilities possessed by students after receiving their learning experience.

Assessment is the process of collecting and processing information to measure students' abilities after participating in the learning process and to determine corrective steps that must be taken in further learning. The progress of student learning outcomes in a science learning activity can be illustrated through evaluation activities which can be used as a basis for making decisions on student success in learning. In the practice of evaluating students, a measuring instrument or instrument is needed. According to Government Regulation No. 23 of 2016, assessment instruments are tools used by educators that can be in the form of tests, observations, individual or group assignments, and other forms that are in accordance with the competency characteristics and level of development of students. The definition an instrument within the scope of the evaluation is defined as a device for measuring student learning outcomes which includes learning outcomes in the cognitive, affective, and psychomotor domains. According to Bajpai et al. (2014), Arifin (2017), and Mohajan (2017), a good instrument is an instrument that meets certain requirements or rules, can provide accurate data according to its function, and only measures certain behavioral samples. The characteristics of a good evaluation instrument are valid, reliable, relevant, representative, practical, discriminatory, specific and professional.

Method

This type of research is descriptive quantitative in which the researcher describes and analyzes the data in the form of instruments made by science teachers (Physics, Chemistry, Biology). This research was conducted at SMA Negeri 6 Banda Aceh. The sample in this study was 11 teachers who taught science and mathematics subjects. Data collection techniques to be used in this study are documentation and questionnaire.

Documentation

Documentation is carried out to support research where not everything can be known by observation and interviews alone. According to Arifin (2017) documentation is also a method of collecting quantitative data by viewing or analyzing documents made by the subject himself or other people about the subject. Documentation is used to obtain instrument form data, question items, answer keys, student answer patterns, competency standards, basic competencies, indicators and question grids by the question authors in writing questions for IPA class XI IPA-1 SMA Negeri 6 Banda Aceh for the 2020/2021 academic year.

Questionnaire

According to Sugiyono (2018) Questionaries or questionnaires are data collection techniques that are carried out by giving a set of questions or written statements to respondents to answer. This technique is used to obtain data from respondents regarding the preparation and constraints of teachers in making student learning instruments online. The number of statements submitted in this questionnaire totaled 30 statements which were divided into 15 statements regarding the preparation of instruments and 15 statements regarding teacher constraints in making student learning outcomes instruments online. The grid for preparing the questionnaire in this study is shown in Table 1.

Table 1. Instruments for Planning and Teacher Constraints in Making Instruments for Student Learning Outcomes Online

Variable	Indicator	Items
Planning the Assessment	Setting goals	3
	Composing the instruments	2
	Composes the lattice of the questionnaire	3
	Writing the questions based on the lattice of the questionnaire	3
	Determine the quality criteria of questions	2
	Develop scoring guidelines	2
Teacher constraints in compiling instruments	Lack of time	1
	lack of understanding	1
	difficulty in compiling questions	3
	too many techniques in the assessment	2
	No supervision	2
Total		24

Questionnaire arranged in the form of a Likert Scale model. According to Sugiyono (2018) the Likert scale is used to measure attitudes, opinions, and perceptions of a person or group of people about social phenomena. In this study, the authors used a closed questionnaire, that is, the respondents only had to choose the alternative answers that had been provided. The alternative answers are shown in Table 2.

Table 2. Questionnaire Answer Score Scale

Perception of Respondents	Score
Always (AL)	5
Often (OF)	4
Sometimes (SO)	3
Rarely (RA)	2
Never (NE)	1

Source: Quantitative research method (Sugiyono, 2018)

To provide an interpretation of the science teacher's perceptions in compiling online student learning outcomes instruments, a theoretical average benchmark is used (μ) and the theoretical standard deviation (σ), with details (Azzarkasyi et al., 2022): $X \leq (\mu - 1,5\,\sigma)$: The teacher's perception of compiling online learning outcomes instruments is very low; $(\mu - 1,5\,\sigma) < X < (\mu - 0,5\,\sigma)$: The teacher's perception of compiling online learning outcomes instruments is low; $(\mu - 0,5\sigma) < X \leq (\mu + 0,5\sigma)$: Teacher perceptions in compiling instruments for online learning outcomes are moderate; $(\mu + 0,5\sigma) < X (\mu + 1,5\,\sigma)$: The teacher's perception of compiling online learning outcomes instruments is high; $(\mu + 1,5\sigma) < X$: The teacher's perception of compiling online learning outcomes instruments is very high.

Result and Discussion

Based on the results of the research that has been done, the teacher's perception in planning the assessment is at 73% with a very high category; 27% in the high category. While the moderate, low, and very low categories are at 0%. This shows that the teacher has set goals, compiled instruments, compiled grids, written questions based on the grid, determined the quality criteria of questions and developed scoring guidelines. So, based on the results of the questionnaire answers given by respondents regarding teacher performance in planning assessment instruments in general it can be concluded that planning instruments for online IPA learning outcomes at SMA Negeri 6 Banda Aceh has been done very well.

Furthermore, the teacher's perception of the obstacles encountered in compiling instruments online includes the allocation of learning time that does not include conducting student assessments, rarely using other free time to compile question instruments, lack of understanding, and difficulties in preparing questions. In fact, time management greatly influences the quality of student learning (Zebua & Santosa, 2023).
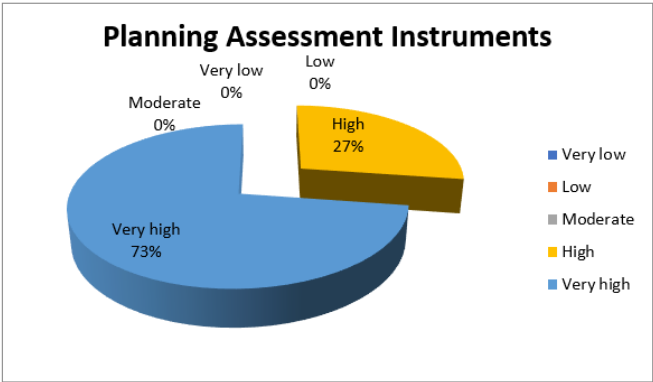
Figure 1. Planning assessment instruments

Based on the results of the questionnaire answers given by respondents regarding the teacher's constraints in compiling online assessment instruments, the results

obtained were 64% in the low category and 36% in the very low category. Only the time allocation variable is still an obstacle for teachers because the instruments that have been prepared by the teacher must be re-adjusted to the Google form application so that online assessments can be carried out. However, the teacher overcomes this by giving more time outside of school to overcome these obstacles so that in general it can be concluded that there are no significant obstacles experienced by teachers in planning online IPA learning outcomes instruments at SMA Negeri 6 Banda Aceh. In addition to the time allocation, the constraints faced by teachers in compiling online assessment instruments were very low.
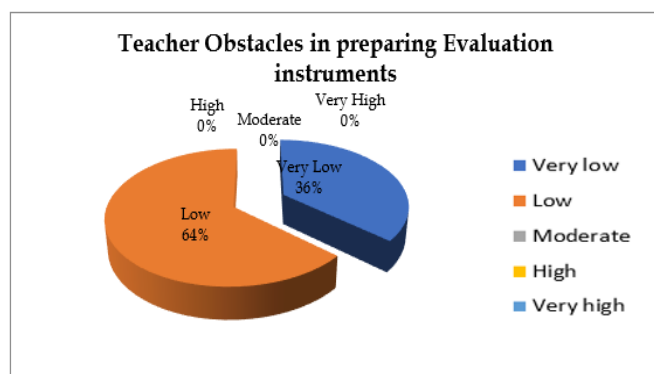
Figure 2. Teacher obstacles in preparing evaluation instruments

Conclusion

Teacher perceptions in compiling Instruments for IPA learning outcomes including online learning of Physics, Chemistry, and Biology at SMA Negeri 6 Banda Aceh have been prepared very well. The teacher's ability to plan online IPA learning outcomes assessment instruments at SMA Negeri 6 Banda Aceh has been carried out very well. This can be seen from the acquisition of 73% very high and 27% high. The teacher's constraints in compiling online instruments also earned a score of 64% in the low category and 36% in the very low category. Several indicators of obstacles faced by teachers compiling online assessment instruments include difficulties in carrying out assessments because they are carried out online, and the allocation of learning time is insufficient in conducting student assessments while other indicators are not an obstacle for teachers in compiling instruments for IPA learning outcomes.

Author Contributions
Syamsul Rizal and Muhammad Azzarkasyi conceptualized the research idea, designed of methodology, management, and coordination responsibility; Juli Firmansyah analyzed data, conducted a research and investigation process; Ibrahim

conducted literature review and provided critical feedback on the manuscript.

Conflicts of Interest
The authors declare no conflict of interest.

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