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Training of Online Assessment for Elementary School Teachers: Perception and Learning Outcomes

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Abstrak: Penilaian online berkembang masif sejak praktik pembelajaran online, namun praktiknya di sekolah dasar belum banyak dieksplorasi. Penelitian bertujuan menginvestigasi persepsi kepuasan dan pengaruhnya dalam meningkatkan wawasan guru SD dari pelatihan penilaian online. Penelitian ini melibatkan 37 guru SD dari 5 sekolah negeri dan swasta di Kota Malang dan dilaksanakan dalam desain pre-test dan post-test. Pelatihan dilaksanakan secara tatap muka dan pendampingan online selama 32 jam. Alat ukur menggunakan triangulasi data pre-test post-test, observasi dan kuesioner online. Analisis data menggunakan statistik deskriptif dan analisis gain score menggunakan Cohen-D. Hasil menujukan persepsi positif dari para peserta pelatihan yang menjelaskan bahwa pelatihan dapat mendorong dan meningkatkan pemahaman tentang urgensi program pengembangan profesionalisme guru. Terjadi peningkatan pemahaman yang signifikan berdasarkan data hasil uji Cohen-D sebesar 1.19. Temuan penelitian ini diharapkan berkontribusi untuk memperkuat teori program pengembangan profesionalisme guru SD dan mendorong penggunaan teknologi yang lebih masif dalam proses penilaian pembelajaran di Sekolah dasar.

Abstract: *Online assessment has developed massively since the practice of online learning, but its practice in elementary schools has not been*

widely explored. The study aimed to investigate the perception of satisfaction and its influence in improving the elementary school teachers knowledge from online assessment training. This study involved 37 elementary school teachers from 5 public and private schools in Malang City and was carried out in a pre-test and post-test design. The training was carried out face-to-face and online mentoring for 32 hours. The measuring instrument used triangulation of pre-test post-test data, observation and online questionnaires. Data analysis used descriptive statistics and gain score analysis using Cohen-D. The results showed a positive perception from the training participants who explained that the training could encourage and improve understanding of the urgency of teacher professional development programs. There was a significant increase in understanding based on Cohen-D test data of 1.19. The findings of this study are expected to contribute to strengthening the theory of elementary school teacher professional development programs and encouraging more massive use of technology in the learning assessment process in elementary schools.

Keywords: ***Online Assessment, Training, Elementary Schools Teacher, Perception, Learning Outcomes***

Introduction

The teacher professional development program is one of the efforts that has been reported to be effective in encouraging improvements in teacher knowledge, attitudes and skills related to their professional competence in carrying out educational and learning tasks (Fernández-Batanero et al., 2022; Sancar et al., 2021; Surahman & Wang, 2023). There are many choices of teacher professional development programs, one of which is through training. Training is an activity designed to hone and develop the competence of teachers related to their duties and work which is packaged in the form of discussion activities, questions and answers, and practice on a particular topic related to certain competencies needed by teachers (Sims & Fletcher-Wood, 2021).

Teachers as the main driving force of learning in schools have the task of designing, developing, implementing and facilitating student learning (Hanuscin et al., 2021; Keiler, 2018; Morrison et al., 2021). Teacher competence in planning, designing, developing, implementing and evaluating educational and learning programs is important to continue to be honed in order to continue to adapt to the demands of the latest developments in science and technology. So that teachers can continue to adapt to the latest technological developments and issues (Ally, 2019;

Keengwe, 2019). It is oriented towards efforts to provide quality learning services to students.

One of the important tasks of teachers in learning is the ability to assess the process and results of student learning in the classroom. Assessing the process and results of learning requires adequate special skills, especially in the era of increasingly rapid technological development like today. Online assessment assisted by information and communication technology in digital space and environment is one option that teachers can do (Bakerson, Trottier, Mansfield, 2015; LaFlair et al., 2022; Ndibalema, 2021). The development of digital-based learning and assessment has the potential to maximize the advantages of digitalization for learning.

Online assessment in learning provides several advantages, including a process that is easy, fast, effective and makes it easier for teachers to measure learning outcomes (Surahman & Wang, 2022; Yazici et al., 2022). Online assessment also allows for fast implementation in the process of preparing measuring instruments, the assessment process, and reporting. However, online assessment also has the potential to raise several problems such as the problem of the suitability of the type of technology and devices used, the suitability of the level of student ability in using it, and the ease of operation in the eyes of teachers (Surahman & Wang, 2022). Another thing that is homework is the issue of threats to the integrity of the quality of learning (Clinciu et al., 2021; Steinberger et al., 2021). However, some of these things have not been widely reported in the context of learning in elementary schools, because most of the learning processes at the elementary school level have not used many digital technology devices for their assessment processes.

Online assessment is an activity to assess the process and/or results of student learning which is carried out online using certain digital technology and devices, either directly in class or online (Costello et al., 2018; Seo & De Jong, 2015). Online assessment allows teachers to design the form and format of assessment according to the characteristics of the subject matter. Some forms of assessment in online assessment can be objective assessments such as multiple-choice questions, essays, or non-objective such as using portfolio assessments, authentic assessments, project-based, problems and performance.

Online assessment in elementary school learning practices is not an easy matter to implement. This is due to several factors such as student readiness factors in using supporting devices for online assessment practices, limited teacher competence in designing and using software and supporting applications for online assessments,

limited devices and internet access, however, research related to the implementation of online assessment in elementary school learning practices cannot be separated from online learning practices and has been reported by several researchers (Herwin et al., 2021; Hódi & Tóth, 2024; Zhan et al., 2024).

Online assessment has become a new trend in learning, including in elementary schools, since the implementation of the online learning policy due to the COVID-19 pandemic that occurred from early 2020 to late 2022 (Adedoyin & Soykan, 2020; Bolatov et al., 2020). Online learning situation forces teachers and students to conduct online assessments. However, the practice is not as easy as imagined, as research conducted in Hong Kong reported several challenges in online assessment practices. However, Hódi & Tóth (2024) reported that online assessment for elementary school students can be designed on several specific subject materials, one of which is for language subjects related to students' phonological awareness. To overcome the problem of limited insight of elementary school teachers in designing, developing, implementing and assessing the results of online assessments. One effort to improve the knowledge and skills of elementary school teachers is through in-house training activities using training and workshops on online assessment.

This study educates elementary school teachers to design and develop online assessments. Specifically, this study aims to measure the perceptions and reactions of training participants and their correlation to the results of increasing participants' knowledge before and after participating in online assessment development training at the elementary school level. The expected contribution of this study is to provide additional literature reports on the potential for online assessment applications in elementary school education and to measure how a training affects teachers' insight related to their professional development program in assessing student learning processes and outcomes. This study is expected to provide additional discourse on the potential for developing and implementing digital learning policies in elementary schools, especially on how learning assessments can be carried out online.

Method

This study is the result of community service activities. In terms of method, this study uses a descriptive method with a mix method approach. The method of implementing community service activities includes three ongoing steps, namely analysis of partner needs, development of solutions and technology according to partner needs, implementation of solutions and application of developed technology,

and monitoring and evaluation of activities. Visually, the implementation image can be seen in Figure 1.

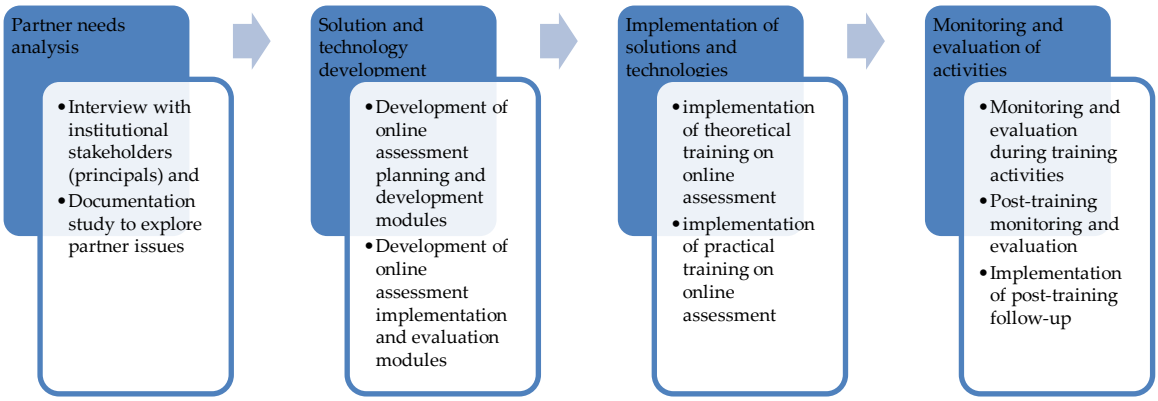

Figure 1. Method of Implementing Community Service Activities

In practice, both the activity implementation team and partners contribute to supporting the success of the activity implementation. Table 1 illustrates the division of work between the proposing team and partners at the target location.

Table 1. Roles of The Implementation Team and Partners

Role of the Implementation Team	Partner Roles
• Preparation of activity proposals • Provision of activity implementation team • Provision of resource persons for activities • Provision of activity funding • Provision of activity consumption • Provision of activity documentation	• Providing information according to team needs • Provision of time, place and location of activities • Coordinating activity participants • Provision of training support devices • Provision of supporting devices for activity participants

Training Evaluation

To measure the achievement and impact of the activity, we used several approaches, first the involvement of participants in the activity, second the results of the understanding test through pre-test and post-test, then the participant satisfaction survey questionnaire on the implementation of the activity. This method was chosen to make it easier to measure the impact of training for participants. Ideally, the impact

is measured after training, but due to time and resource constraints, what is more possible to measure is the increase in understanding, and the perception of satisfaction from participants towards the training material presented. The pre-test and post-test questions used 15 questions about understanding the online assessment material. The satisfaction questionnaire in the form of 58 questions contains 3 main aspects, namely feedback and perceptions about teacher professional development, perceptions of activity satisfaction and perceptions about online assessment as presented in Table 2.

Table 2. Aspects of Participant Response Size

No	Measured Aspects	Number of Items
1	Perceptions about teacher professional development	6
2	Perception of satisfaction with training activity services	15
3	Participants' perceptions of online assessment	37

Each feedback item is measured using a 5-point Likert Scale with descriptions as presented in Table 3. The Likert scale was chosen to make it easier for respondents to express their responses and to make it easier for researchers to analyze data from respondents' answers.

Table 3. Description of the 5 Likert Scales Used

No	Number	Information
1	1	Strongly disagree
2	2	Disagree
3	3	Neutral
4	4	Agree
5	5	Strongly agree

As for the method of measuring the impact of influence (effect size), we use the Cohen D/Glass Delta and Hedges forum approach and calculations which can be accessed online viahttps://www.socscistatistics.com/effectsize/default3.aspx. Simply put, the formula is as follows:

Cohen's d = (M2- M1)/SDpooled

Where

SDpooled = √((SD12 + SD22)/2)

After that the results will appear and then be visualized using **https://rpsychologist.com/cohend/**. The interpretation table of the effect size (ES) results data is presented in Table 4. The data illustrates the significance of the impact of a treatment on the dependent variable measured in the study.

Table 4. Interpretation of Effect Size Score

Effect Size (ES)	**Interpretation**	**Cohen's D Effect Size**	**Interpretation of the Effect Magnitude**
0.00≤ ES < 0.20	Ignored	0.01 ≤ |d| < 0.2	Very small effect
0.20 ≤ ES < 0.50	Small	0.2 ≤ |d| < 0.5	Small effect
0.50 ≤ ES < 0.80	Moderate	0.5 ≤ |d| < 0.8	Medium effect
0.80 ≤ ES < 1.30	Large	0.8 ≤ |d| < 1.2	Large effect
1.30 ≤ ES	Very large	1.2 ≤ |d| < 2	Very large effect
		2 ≤ |d|	Huge effect

Result and Discussion

In this section, information is presented about the context and subject of the training program being implemented. Then, data from the results of the perception questionnaire on the training program being implemented is presented, and it ends

with an explanation of the impact of the participants' learning outcomes through pre-test and post-test data before and after the training is implemented.

a. Context and Subject

In general, the activity went smoothly as planned. The activity was held on Thursday, August 2, 2024 at SDN X 3 Malang City. The number of participants who attended as planned was 37 participants plus 4 speakers and 3 accompanying students, so that the total was 44 participants from 4 schools in one cluster. The number of samples used in this study was based on purposive sampling based on delegate data from partner schools involved in the training conducted. The number of subjects from school A was greater because it involved all of its teachers, while from other schools only involved invited delegates. The number of participants and the list of schools involved are presented in Table 5.

Table 5. List of Schools and Number of Participants

No	School From	Number of participants
1	Public Elementary School A	21
2	Public Elementary School B	4
3	Public Elementary School C	4
4	Private Elementary School A	4
5	Private Elementary School B	4
Total		37

In general, the learning process in training begins with an opening activity, and the delivery of the intent and purpose of the community service program implementers. Next, a welcoming speech from the partner institution. Next, entering the first material on teacher professionalism development. Then entering the material on online assessment, which starts from pre-test activities, material, Q&A discussions, post-tests, and continued training in an online system that is monitored remotely. After the material is finished, there is a closing from the partner representative delivered by the Principal. Table 6 shows a list of materials and the number of training hours and training speakers.

Table 6. Training Materials, Training Hours, and Speakers/Trainers

No	Training Materials	Number of Training Hours	Speaker/Trainers
1	The importance of developing teacher professionalism from school principals (partners)	4 Learning Hours	Mochammad Rifai, S.Pd
2	Online assessment design and development strategies	9 Learning Hours	Dr. Agus Wedi, M.Pd.
3	Application for learning assessment	9 Learning Hours	Dr. Yerry Soepriyanto, ST, MT
4	Processing and reporting of online assessment results	9 Learning Hours	Ence Surahman, S.Pd., M.Pd, Ph.D

Figure 2. Training Speakers

Gender

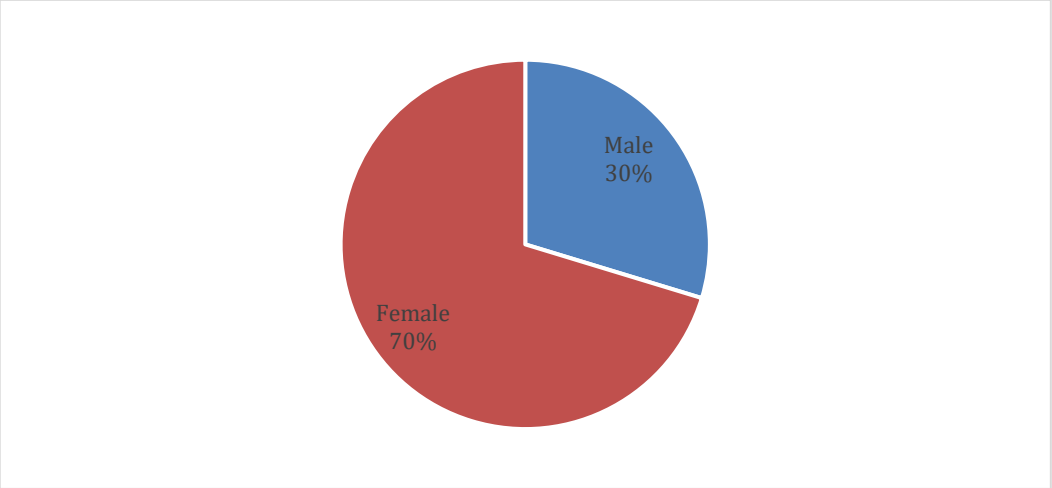

Figure 3. Participant demographics

Based on the data in Figure 1, it can be explained that 70.3% of the participants were female and 29.7% were male.

Participant Perception

Tables 7 and 8 present the data from the online questionnaire distributed to the training participants after the training was completed. There were 21 questions asked using a 5-point Likert scale.

Table 7. Participants' Perception Regarding Teacher Profesional Development Program

No	Item	Total	Mean	SD
1	I understand the main duties and main functions as a professional educator	165.00	4.46	0.61
2	I understand the 4 competencies of professional educators	162.00	4.38	0.59
3	I understand the urgency of knowing the characteristics of students	164.00	4.43	0.60
4	I realize the urgency of developing professional educator competencies.	163.00	4.41	0.55
5	I am motivated to participate in scientific forum activities such as seminars, training, workshops to improve teacher competence.	163.00	4.41	0.64
6	I am motivated to take online courses at IndonesiaX, EdX, Coursera, Udemy etc.	148.00	4.00	0.71

Table 8. Participants' Perception Regarding Training Program

No	Item	Total	Mean	SD
1	I understand the concept of online assessment	155.00	4.19	0.66
2	I understand the 21st century learning paradigm which requires IT in its process.	158.00	4.27	0.73
3	I understand the recommended learning models for 21st century learning.	155.00	4.19	0.62
4	I understand the characteristics of educators in the 21st century	159.00	4.30	0.57
5	I love online learning	152.00	4.11	0.81
6	I am interested in trying to develop online learning	158.00	4.27	0.61
7	I am interested in trying to develop an online quiz	163.00	4.41	0.60
8	In general, the training had a positive impact on my enthusiasm in developing innovative learning.	167.00	4.51	0.56
9	Online assessment development training is useful for improving my competence	167.00	4.51	0.61
10	The speakers have good skills in delivering the material.	168.00	4.54	0.56
11	The resource persons have good skills in packaging training to make it interesting.	165.00	4.46	0.61
12	In general, the committee's service was satisfactory.	167.00	4.51	0.51
13	The selection of the training location is correct	167.00	4.51	0.61
14	Availability of satisfactory facilities and services	170.00	4.59	0.55
15	Adequate internet access	158.00	4.27	0.69

Based on the data and information explained in the table 7 and 8, it can be concluded that the participants were interested in the training conducted. The participants liked the online quizzes in learning. The majority of participants admitted that they found it easy to determine the learning approach, could use computers and media in learning. And were interested in learning models that were in accordance with the 21st century learning patterns.

Next, the data from the researcher's observations during the training activities, in general the participants seemed enthusiastic in listening to the material. In addition, the participants also showed interest when the speakers demonstrated one of the online research applications used. Several participants seemed interested in trying and using the application demonstrated by the speaker.

Table 9 presents the pre-test and post-test results of participants before and after the training was conducted. We used 15 questions around the online assessment

development material. Measurements were carried out using online quizzes to facilitate the distribution and processing of results.

Table 9. Participants' Pre-test, Post-test and Gain Score

No	Participant	Pre Test	Post Test	GainsScore
1	Participant 1	80	100	20
2	Participant 2	73	80	7
3	Participant 3	73	87	14
4	Participant 4	73	87	14
5	Participant 5	73	87	14
6	Participant 6	73	100	27
7	Participant 7	67	87	20
8	Participant 8	67	80	13
9	Participant 9	67	53	-14
10	Participant 10	67	67	0
11	Participant 11	67	93	26
12	Participant 12	67	80	13
13	Participant 13	67	73	6
14	Participant 14	53	73	20
15	Participant 15	53	87	34
16	Participant 16	53	93	40
17	Participant 17	47	47	0
18	Participant 18	47	87	40
19	Participant 19	47		-47
20	Participants 20	40	80	40
21	Participant 21	40	67	27
22	Participant 22	33	87	54
23	Participant 23	33	60	27
24	Participant 24	27	80	53
25	Participants 25	27	47	20
26	Participant 26	20	33	13
27	Participant 27	20	47	27
28	Participant 28	13	67	54
29	Participant 29	13	47	34
30	Participants 30	0	47	47
31	Participant 31	47	87	40

32	Participant 32	60	87	27
33	Participant 33	27	47	20
34	Participant 34	87	93	6
35	Participant 35	13	67	54
36	Participant 36	40	60	20
37	Participant 37	40	47	7

Summary of pre-test and post-test data of training participants are shown in the Table 10.

Table 10. Average pre-test, post-test and gain score data

Data	**Pre-test**	**Post-test**	**Gain**
Average	43.91	68.51	23.25
Deviation Standard	21.01	20.02	20.86

Based on the data in Table 10, in general, the average training participants experienced an increase in understanding of the online assessment material of 23.25 with an average pre-test of 43.91 and post-test of 68.51. Based on the data in Figure 4, it can be seen that all participants experienced significant improvement. Although the training material was considered new, some participants were able to follow the material well, as evidenced by the post-test results which experienced improvement. The average data on the increase in learning outcomes can be seen in the Figure 4.

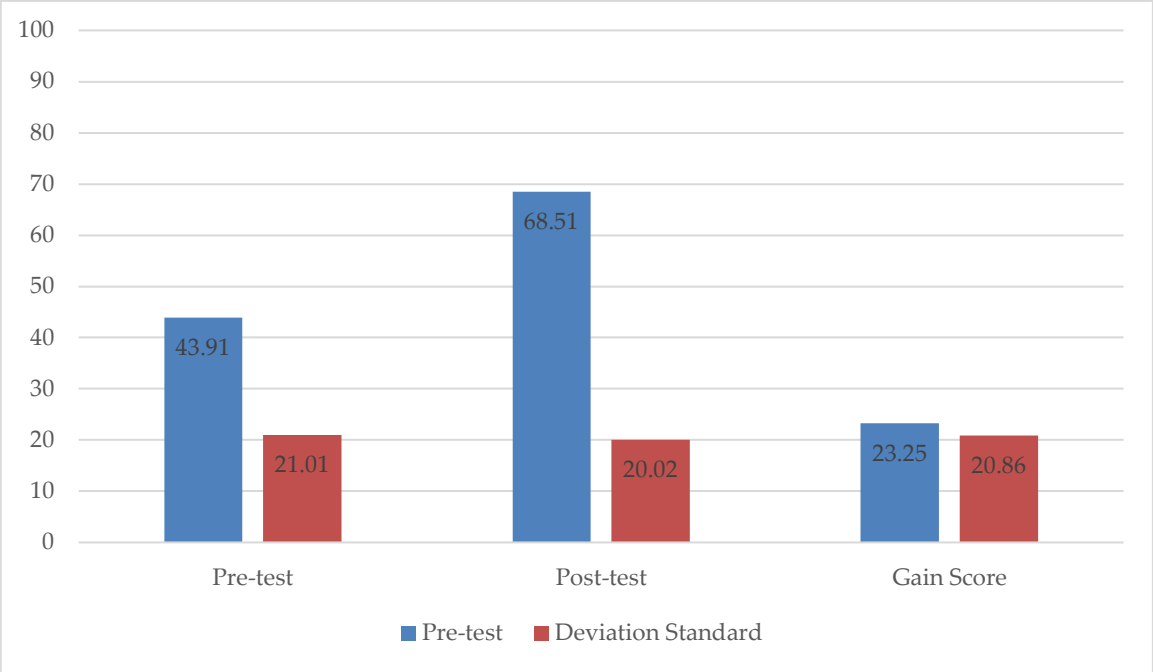

Figure 4. Pre-test, post-test and gain score data

In addition to using the initial and final test measurement approaches, we also measured the training participants' perceptions of the material activities presented. The following is a summary of the results of the participants' perceptions. To measure the magnitude of the influence of the training we conducted, we used a calculation method.

Cohen's d = (M2- M1)⁄SDpooled
Where SDpooled= √((SD12+ SD22)⁄2)
then obtained
Cohen's *d* = (68.51 - 43.91)/20.520971 = 1.198774.
Glass's *delta* = (68.51 - 43.91)/21.01 = 1.170871.
Hedges' *g* = (68.51 - 43.91)/20.520971 = 1.198774.

Then the impact influence data was obtained as shown in Figure 5.

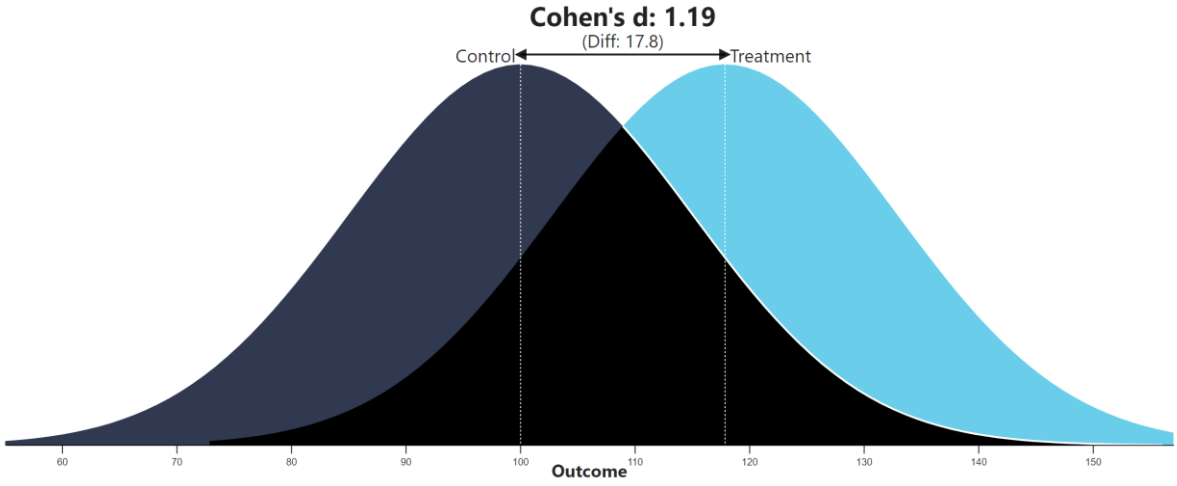

Figure 5. Visualization of Cohen-D score

The participants were enthusiastic in following the material from the beginning to the end of the training. This shows the participants' interest in the presentation of the material presented by the four speakers. The participants were provided with systematic, simple, practical and applicable material related to the urgency of developing teacher professionalism, introduction to online assessment, designing online assessments, introduction to online assessment applications and practices for developing online assessments and practices for processing learning assessment data using a scientific approach that is easy to follow the stages.

The next finding, participants are interested in exploring the material for developing online assessments for elementary school learning. This marks a positive response from teachers to develop learning assessments. A positive response is expected to arouse the desire to apply it in everyday learning adjusted to the characteristics of the subject matter. Furthermore, participants are interested in trying to develop online assessments in their learning in elementary school. The participants' interest in the training material is in line with the achievement of post-training learning outcomes (Surahman et al., 2020).

The development of teacher professionalism in designing innovative learning has been carried out by several previous researchers. Ismiyati et al. (2024) reported training to improve teacher competency through mentoring in curriculum-based independent learning planning. Meanwhile, Abdul Azis et al. (2021) training online learning media as an alternative for online learning. Furthermore, training on computational thinking skills of elementary school teachers reported by Surahman et al. (2020). In essence, teacher training is important for the development of teacher professionalism in order to encourage the quality of learning. However, the

implementation of teacher professional development in each school can also be influenced by leadership support, teacher motivation and policies from the education office.

This research contributes to the emergence of new discourses on the potential for developing and cultivating online assessment practices in elementary school learning while still considering the characteristics of the subject matter, the readiness of teachers and students, and the availability of adequate supporting systems and devices. In addition, in practice, this research also contributes to increasing teachers' insights and skills on how to plan and design online assessments in elementary school learning.

Conclusion

Based on the description in the results and discussion section, it can be concluded that the training activities have been carried out according to plan. The perception of the training participants is in the positive category, reinforced by data on the increase in participant learning outcomes using pre-test and post-test data with an average gain score of 23.25 and obtaining a Cohen-D test score of 1.19 which is in the significant impact category. In addition to its advantages, this study also leaves limitations, namely that this training only reaches the level of learning and reaction evaluation, it cannot measure the evaluation of the impact of the training results due to time constraints. In the next project, ideally there is a measurement of the output impact of the training related to the percentage of teachers and subjects who are accustomed to using online assessments.

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