Validity and Reliability of IoJEPD Model Instruments to Improve Elementary School Teacher Competence

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Abstract

This study aims to test the validity and reliability of the IoJEPD model instrument to improve the competence of elementary school teachers. This study uses content validity. Quantitative methods and professional experts are the considerations used in this research. The stage of proving the validity of this instrument is carried out utilizing a validation process involving three experts in the fields of learning, evaluation, and experts in the field of instrument preparation. Validity is carried out in the form of a rating scale, which is shown at the level of agreement of the validator rating on the validation items and the Cronbach Alpha Coefficient to measure reliability. The results showed that: a) 15 items of interview guidelines were valid with a validity index range of 0.883; b) 17 items of valid teacher response questionnaire with a validity index range of 0.877;c) 50 valid pedagogical competency questionnaires with a validity index range of 0.865, and d) 40 valid professional competency questionnaires with a validity index range of 0.838. With Cronbach's Alpha coefficient, the reliability of the pedagogical competency test above is 0.901 and the professional competency test is 0.810. So it can be concluded that the scale is valid and very reliable to measure the professional and pedagogic competence of elementary school teachers.

Keywords: validity, reliability, IoJEPD Model, teacher competence.

Introduction

The world of education is entering the era of industrial revolution 4.0, where teachers are required to utilize information technology and be balanced with competencies that meet standards. Each country has standards of pedagogic competence, personality competence, professional competence, and social competence. According to (Ishak, 2018) industrial competence 4.0 demands educators in three aspects, namely skills, emotional intelligence, and cognitive flexibility. The skills in question include the ability to solve problems, critical thinking, creativity in teaching, management skills, and being ready to coordinate, assess and make decisions (Sitorus et al., 2021). As for emotional intelligence, an educator must be able to master self-awareness, social awareness, self-management, and relationship management. While cognitive flexibility is more directed at the ability to develop competencies based on the development of knowledge, using communication in the implementation of the two systems, and the ability of the system to make a person able to make decisions independently.

Teachers are said to be professional (competent) if they have work skills or special skills that are following the demands of the field of work concerned (Subarno & Dewi, 2019). Not all competencies possessed by a person indicate that he is professional because professional competence not only shows what and how to do a job but also masters the knowledge that can answer why it is done based on certain concepts and theories (Hui & Abdullah, 2020). Professional competence is very important to be mastered by a teacher (Polizzi et al., 2019).

With the professional competence of teachers, learning will be fun and interesting (Paquay et al., 2022).

Teachers, in addition to being required to master the subject matter well, are also able to communicate the material in a good way and strategy, so that it is easy to capture and master the material (Subarno & Dewi, 2019). Teachers who have good pedagogic competence will be able to understand what is needed and desired in learning (Anif et al., 2019)is also known as a forum of all subject teachers with a strategic role in increasing teachers' professionalism in carrying out their duties as professional teachers. The main objectives of the study were to describe the mechanism of pedagogical competence development activities for biology teachers in a post-certification program through MGMP forum and to identify the characteristics of the activities of biology MGMP. The research method was of survey type and the data collection instruments were a list of questions, polling, and a

questionnaire. The respondents included the head of educational quality assurance agency or LPMP (Lembaga Penjamin Mutu Pendidikanis also known as a forum of all subject teachers with a strategic role in increasing teachers' professionalism in carrying out their duties as professional teachers. The main objectives of the study were to describe the mechanism of pedagogical competence development activities for biology teachers in a post-certification program through MGMP forum and to identify the characteristics of the activities of biology MGMP. The research method was of survey type and the data collection instruments were a list of questions, polling, and a questionnaire. The respondents included the head of educational quality assurance agency or LPMP (Lembaga Penjamin Mutu Pendidikan. Teachers provide more opportunities for learning (Korpachyova et al., 2020) so that they can form a positive attitude (Bucea-Manea-Țoniş et al., 2020). In addition, pedagogic competence is an inherent competence to be possessed by a teacher (Medina, 2018). This is because in pedagogic competence the teacher can understand the characteristics of the student learning environment (Wang, 2021).

However, in reality, there are several obstacles faced by the central government and local governments in improving teacher competence. The problem is the lack of training to improve competence so teachers have to look for the training program using their costs. By using their funds, only a few teachers participate in training in improving their competence. In addition, the lack of teachers in writing scientific articles, conducting research, understanding learning theories, compiling learning tools, attending training and scientific forums as well as several other activities to develop self-potential. In the learning process, there is still a lack of adequate facilities, especially in the field of technology.

The toughest challenges for elementary teacher competency development relate to the time available for training, sources of materials, media, and an objective assessment system to measure and assess the competencies they have mastered. The demands for the workload of elementary school teachers as classroom teachers who have to teach all subjects take up a lot of time. As a result, there is little time available to do the training tasks. The habit of elementary school teachers who relatively rarely access learning resources, both printed and electronic, will make it difficult for teachers to independently obtain and update training materials (Korpachyova et al., 2020). Teachers will further increase their competence if they often participate in training activities. However, there are several obstacles faced such as too much administration that must be made so that it makes teachers find it difficult to do it. In the preparation of the lesson plans, there are still too many components, causing a lot of preparation that must be done by the teacher before teaching. It is not uncommon for some teachers to only ask for lesson plans from other teachers and not make their own.

Based on UKG SD data in Yogyakarta, it shows that pedagogic competence is the lowest competency among other teacher competencies. This is reinforced by the results of the UKG SD in Yogyakarta which showed pedagogic competence with a score of 60.94. Seeing the reality of the low level of pedagogic competence and professional competence according to the UKG 2019 results data in Indonesia, as described above, the Ministry of Education and Culture launched the Continuous Professional Development (PKB) program as one of the efforts to accelerate teacher competency improvement. In line with this policy, the State Minister for State Apparatus Empowerment and Bureaucratic Reform enacted Regulation No. 16 of 2009 regarding teacher functional positions and credit scores, among others stating that in principle PKB is a continuous professional development carried out by the needs of teachers to achieve professional competency standards and improve their competence above the standard of professional competence which at the same time has implications for the acquisition of credit points for promotion or functional teacher positions.

As for efforts to resolve some of these obstacles, a model is needed that functions to improve teacher competence. The model that can be used to overcome these problems is in the form of training and guidance that is carried out on an ongoing basis so that the knowledge gained can be applied to support teacher quality improvement, one of which is Job Embedded Professional Development (JEPD). JEPD provides learning opportunities through individual or collaborative activities carried out while at school. The emphasis in the choice of the JEPD model is on teacher investigation, discussion, planning, decision making, and data use (Kleickmann, 2013).

This learning model provides great opportunities and challenges, both for our preservice and in-service teachers (Arifin et al., 2020). This training model has been implemented by LPPM DIY but the results have not been maximized. The impact and reflection of this model have not been measured so there is a need for further studies on the application of this JEPD model. In addition, teachers who attend workshops or training are selected in turn so that they are often not based on the needs and desires of teachers in improving their pedagogical competencies (Adegbola, 2019). The IoJEPD model is designed to meet the needs of teachers so that the syntax of the training will be more adapted to the conditions in the field. In addition, this model must also be adapted to developments in the 4.0 revolution era, every teacher must master technology in improving their competence. The application of the IoJEPD model is also carried out systematically and continuously. This training system is a unit consisting of components of input, process, output, outcome, and reflection. Through the application of the IoJEPD model, it is expected to be able to maintain, improve and update the quality of teachers on an ongoing basis to improve the pedagogic competence of teachers in carrying out their duties as professional educators (Adegbola, 2019). During the learning process, LPPM rarely

conducts pedagogic and professional competency tests for elementary school teachers. Teachers must understand the right training model to be able to improve their competence. This adds to the urgency of developing a pedagogic and professional competency questionnaire measuring instrument in the form of a closed scale that has a high validity value. Based on these problems, it is necessary to test the validity and reliability of the IoJEPD model instrument for teachers which can later be used to identify pedagogic and professional competencies.

METHOD

Research design

This research is included in the type of quantitative research to see the validity and reliability of the IoJEPD model instrument.

Participants

Samples were taken randomly mounting to as many as 70 elementary school teachers teaching in Yogyakarta. Characteristics of the participants in this study were teachers who did not receive much training on competency development for elementary school teachers.

Data collection tools

The stage of proving the validity of this instrument is carried out using a validation process involving three experts in the fields of learning, evaluation, and experts in the field of instrument preparation. Validity is carried out in the form of a rating scale, which is shown at the level of agreement of the validator rating on the validation items and the Cronbach Alpha Coefficient to measure reliability (Utami et al., 2021) (Table 1 to 4).

Table 1: Interview Guidelines

No	Indicator	Item Statement	Amount
1.	Competency of Elementary School Teachers	1,2,3,4,5	5
2.	Teacher professionalism development model	6,7,8,9,10	5
3.	Learning constraints	11,12,13, 14,15	5
Total			15

Table 2: Teacher Response Questionnaire

No	Indicator	Item Statement	Amount
1.	Material /Content of IoJEPD Model	1,2,3,4,5, 6,7	7
2.	Learning Process	8,9,10,11	4
3.	Language	12,13	2
4.	Rating	14,15,16,17	4
Total			17

Table 3. Pedagogical Competency Test Grid

No	Sub-competency	Indicator	Item Statement	Amount
1	Understanding students	Understanding students by utilizing the stages of child development (Cognitive, moral, and social)	6	12
		Understanding students by utilizing the principles of personality	2	
		Identify the initial teaching provisions of students.	4	
2	Designing learning	Applying learning and learning theory	2	10
		Determining learning strategies based on the characteristics of students, competencies to be achieved, and teaching materials.	2	
		Develop a learning plan based on the chosen strategy	6	
3	Implement learning	Setting the learning setting	3	8
		Implementing conducive learning	5	
4	Evaluation of learning outcomes	Carry out a continuous assessment (assessment) of learning processes and outcomes using various methods	2	13
		Analyze the results of the assessment process and learning outcomes to determine the mastery level of learning	4	
		Using learning completeness information to design a remedial or enrichment program	3	
		Utilizing the results of learning assessments to improve the quality of learning programs in general.	4	
4	Student development	Facilitate students to develop various academic potentials.	3	7
		Facilitate students to develop various non-academic potentials.	4	
TOTAL				50

Table 4: Professional Competency Test Grid

No	Sub-competency	Indicator	Item Statement	Amount
1	Understanding the teaching materials in the school curriculum	Understand the material to be taught	3	7
		Addition of relevant references	2	
		Completion of material	2	
2	Mastery of scientific concepts and patterns of thinking	Interpreting the material, structure, and mindset of the subjects taught	2	2
3	Mastering the knowledge and mastery of teaching methods and models.	Interpreting the material, structure, and mindset of the subjects taught	2	8
		Mastering learning methods.	2	
		Mastering the learning model.	6	
4	Mastering knowledge of assessment	Procurement	2	6
		Procurement of remedial	2	
		Procurement of evaluation	2	
5	Able to do planning	Selection of teaching materials	2	9
		Use of learning media	4	
		The use of learning methods	3	
6	Implementation of teaching programs	Student seating arrangement	2	8
		Giving Q&A session	2	
		Giving additional material	4	
TOTAL				**40**

Data analysis

The validity used is content validity. Content validity is carried out to see the accuracy of the indicators, the formulation of the statement/question items, the formulation of the answer choices, and the accuracy score of the instrument statement items then analyzed to see the validity. The reliability test was carried out using the Alpha formula from Cronbach (Aminnuddin, 2020). Validity and reliability were tested by statistical analysis using SPSS 20 for Windows (Irmita & Atun, 2018).

Findings

A. Validity

The stage of proving the validity of this instrument is carried out using a validation process involving three experts in the fields of learning, evaluation, and experts in the field of instrument preparation. Content validity is done to see the accuracy, indicators, formulation of statement/question items, formulation of answer choices, and accuracy scores of instrument statement items, which are then analyzed to see their validity. This validity is carried out in the form of a rating scale, which is indicated at the level of agreement of the validator rating on the validation items. The content validity index of each item is calculated by the formula (Jolink & Niesten, 2021), as shown in the following formula:

$$V = \Sigma n_i \mid i - lo \mid / [N(c - 1)]$$

Information:
V= validity index
n = number of raters who chose Category
i = weight of each category
N= number of assessors
c = number of categories

1) Content Validity of Interview Guidelines

Table 5: Results of Validation of the Contents of Interview Guidelines

No	Expert 1	Expert 2	Expert 3	S₁	S₂	S₃	Σs	n(c-1)	V	Description	Category
1	4	5	4	3	4	3	10	12	0,833	Valid	High
2	4	5	5	3	4	4	11	12	0,917	Valid	High
3	4	5	5	3	4	4	11	12	0,917	Valid	High
4	3	5	5	2	4	4	10	12	0,833	Valid	High
5	3	5	5	2	4	4	10	12	0,833	Valid	High
6	4	5	5	3	4	4	11	12	0,917	Valid	High
7	3	5	5	2	4	4	10	12	0,833	Valid	High
8	3	5	5	2	4	4	10	12	0,833	Valid	High
9	3	5	5	2	4	4	10	12	0,833	Valid	High
10	4	5	5	3	4	4	11	12	0,917	Valid	High
11	4	5	5	3	4	4	11	12	0,917	Valid	High
12	4	4	5	3	3	4	10	12	0,833	Valid	High
13	4	5	5	3	4	4	11	12	0,917	Valid	High
14	4	5	5	3	4	4	11	12	0,917	Valid	High
15	5	5	5	4	4	4	12	12	1,000	Valid	High
Average Aiken V index									0,883	Valid	High

2) Content Validity of Teacher Response Questionnaire

The following are the results of the validation of the contents of the teacher's response questionnaire. 17 question items are declared valid in the high category.

Table 6: Results of Validation of Teacher Response
Questionnaire Content

No	Expert			S₁	S₂	S₃	Σs	n(c-1)	V	Description	Category
	1	2	3								
1	4	5	4	3	4	3	10	12	0,833	Valid	High
2	4	5	5	3	4	4	11	12	0,917	Valid	High
3	4	5	5	3	4	4	11	12	0,917	Valid	High
4	3	5	5	2	4	4	10	12	0,833	Valid	High
5	3	5	5	2	4	4	10	12	0,833	Valid	High
6	4	5	5	3	4	4	11	12	0,917	Valid	High
7	3	5	5	2	4	4	10	12	0,833	Valid	High
8	3	5	5	2	4	4	10	12	0,833	Valid	High
9	3	5	5	2	4	4	10	12	0,833	Valid	High
10	4	5	5	3	4	4	11	12	0,917	Valid	High
11	4	5	5	3	4	4	11	12	0,917	Valid	High
12	4	4	5	3	3	4	10	12	0,833	Valid	High
13	4	5	5	3	4	4	11	12	0,917	Valid	High
14	4	5	5	3	4	4	11	12	0,917	Valid	High
15	4	4	5	3	3	4	10	12	0,833	Valid	High
16	4	5	4	3	4	3	10	12	0,833	Valid	High
17	5	5	5	4	4	4	12	12	1,000	Valid	High
Average Aiken V index									0,877	Valid	High

3) Content Validity of Pedagogic Competency Questionnaire

The following are the results of the validation of the contents of the pedagogical competency questionnaire. There are 50 question items and it is declared valid in the high category.

Table 7: Results of Validation of Pedagogic Competency
Questionnaire Content

No	Expert			S₁	S₂	S₃	Σs	n(c-1)	V	Description	Category
	1	2	3								
1	4	5	4	3	4	3	10	12	0,833	Valid	High
2	4	5	5	3	4	4	11	12	0,917	Valid	High
3	4	5	5	3	4	4	11	12	0,917	Valid	High
4	3	5	5	2	4	4	10	12	0,833	Valid	High
5	3	5	5	2	4	4	10	12	0,833	Valid	High
6	4	5	5	3	4	4	11	12	0,917	Valid	High
7	3	5	5	2	4	4	10	12	0,833	Valid	High
8	3	5	5	2	4	4	10	12	0,833	Valid	High
9	3	5	5	2	4	4	10	12	0,833	Valid	High
10	4	5	5	3	4	4	11	12	0,917	Valid	High
11	4	5	5	3	4	4	11	12	0,917	Valid	High
12	4	4	5	3	3	4	10	12	0,833	Valid	High
13	4	5	5	3	4	4	11	12	0,917	Valid	High
14	4	5	5	3	4	4	11	12	0,917	Valid	High
15	4	4	5	3	3	4	10	12	0,833	Valid	High
16	4	5	4	3	4	3	10	12	0,833	Valid	High
17	3	5	5	2	4	4	10	12	0,833	Valid	High
18	3	5	5	2	4	4	10	12	0,833	Valid	High
19	4	5	5	3	4	4	11	12	0,917	Valid	High
20	4	5	5	3	4	4	11	12	0,917	Valid	High
21	4	4	5	3	3	4	10	12	0,833	Valid	High
22	4	5	5	3	4	4	11	12	0,917	Valid	High
23	4	5	5	3	4	4	11	12	0,917	Valid	High
24	4	5	5	3	4	4	11	12	0,917	Valid	High
25	4	4	5	3	3	4	10	12	0,833	Valid	High
26	4	5	4	3	4	3	10	12	0,833	Valid	High
27	4	5	4	3	4	3	10	12	0,833	Valid	High
28	4	5	5	3	4	4	11	12	0,917	Valid	High
29	4	5	5	3	4	4	11	12	0,917	Valid	High
30	3	5	5	2	4	4	10	12	0,833	Valid	High
31	3	5	5	2	4	4	10	12	0,833	Valid	High
32	4	5	5	3	4	4	11	12	0,917	Valid	High
33	3	5	5	2	4	4	10	12	0,833	Valid	High
34	3	5	5	2	4	4	10	12	0,833	Valid	High
35	3	5	5	2	4	4	10	12	0,833	Valid	High
36	3	5	5	2	4	4	10	12	0,833	Valid	High
37	3	5	5	2	4	4	10	12	0,833	Valid	High
38	4	5	5	3	4	4	11	12	0,917	Valid	High
39	3	5	5	2	4	4	10	12	0,833	Valid	High
40	4	5	5	3	4	4	11	12	0,917	Valid	High
41	3	5	5	2	4	4	10	12	0,833	Valid	High
42	3	5	5	2	4	4	10	12	0,833	Valid	High
43	4	5	5	3	4	4	11	12	0,917	Valid	High
44	3	5	5	2	4	4	10	12	0,833	Valid	High
45	3	5	5	2	4	4	10	12	0,833	Valid	High
46	3	5	5	2	4	4	10	12	0,833	Valid	High
47	3	5	5	2	4	4	10	12	0,833	Valid	High
48	4	5	5	3	4	4	11	12	0,917	Valid	High
49	3	5	5	2	4	4	10	12	0,833	Valid	High
50	4	5	4	3	4	3	10	12	0,833	Valid	High
Average Aiken V index									0,865	Valid	High

4) Content Validity of Professional Competency Questionnaire

The following are the results of the validation of the contents of the professional competency questionnaire. There are 40 question items and it is declared valid in the high category.
Table 8. Results of Validation of Professional Competency Questionnaire Content

Table 8. Results of Validation of Professional Competency

No	Expert			S₁	S₂	S₃	Σs	n(c-1)	V	Description	Category
	1	2	3								
1	4	4	5	3	3	4	10	12	0,833	Valid	High
2	4	4	5	3	3	4	10	12	0,833	Valid	High
3	4	5	5	3	4	4	11	12	0,917	Valid	High
4	5	5	4	4	4	3	11	12	0,917	Valid	High
5	4	4	5	3	3	4	10	12	0,833	Valid	High
6	5	4	5	4	3	4	11	12	0,917	Valid	High
7	4	5	4	3	4	3	10	12	0,833	Valid	High
8	3	5	5	2	4	4	10	12	0,833	Valid	High
9	3	5	4	2	4	3	9	12	0,750	Valid	Medium
10	4	5	4	3	4	3	10	12	0,833	Valid	High
11	4	5	5	3	4	4	11	12	0,917	Valid	High
12	4	4	4	3	3	3	9	12	0,750	Valid	Medium
13	4	5	5	3	4	4	11	12	0,917	Valid	High
14	4	4	5	3	3	4	10	12	0,833	Valid	High
15	4	4	5	3	3	4	10	12	0,833	Valid	High
16	4	5	4	3	4	3	10	12	0,833	Valid	High
17	3	4	5	2	3	4	9	12	0,750	Valid	Medium
18	3	5	5	2	4	4	10	12	0,833	Valid	High
19	4	5	4	3	4	3	10	12	0,833	Valid	High
20	4	4	5	3	3	4	10	12	0,833	Valid	High
21	4	4	5	3	3	4	10	12	0,833	Valid	High
22	4	4	5	3	3	4	10	12	0,833	Valid	High
23	4	5	5	3	4	4	11	12	0,917	Valid	High
24	4	5	4	3	4	3	10	12	0,833	Valid	High
25	4	4	5	3	3	4	10	12	0,833	Valid	High
26	4	5	4	3	4	3	10	12	0,833	Valid	High
27	4	4	4	3	3	3	9	12	0,750	Valid	Medium
28	4	5	5	3	4	4	11	12	0,917	Valid	High
29	4	4	5	3	3	4	10	12	0,833	Valid	High
30	3	5	5	2	4	4	10	12	0,833	Valid	High
31	3	5	5	2	4	4	10	12	0,833	Valid	High
32	4	4	5	3	3	4	10	12	0,833	Valid	High
33	3	5	5	2	4	4	10	12	0,833	Valid	High
34	3	5	4	2	4	3	9	12	0,750	Valid	Medium
35	3	5	5	2	4	4	10	12	0,833	Valid	High
36	3	4	5	2	3	4	9	12	0,750	Valid	Medium
37	3	5	5	2	4	4	10	12	0,833	Valid	High
38	4	5	5	3	4	4	11	12	0,917	Valid	High
39	3	4	5	2	3	4	9	12	0,750	Valid	Medium
40	4	5	5	3	4	4	11	12	0,917	Valid	High
Average Aiken V index									0,838	Valid	High

B. Reliability

The reliability test was carried out using the Alpha formula from Cronbach. The steps taken by researchers in determining this reliability are estimating each item and the total variance. The results of the next reliability coefficient are as follows:

1) Pedagogic Competence

The pedagogic competency test instrument consists of 50 items.

Table 9. Reliability of Pedagogic Competency Test Instruments

Cronbach's Alpha	N of Items
,901	40

Reliability Statistics

Based on the results of the reliability analysis above, it is 0.901. Obtaining the results of the reliability analysis shows that the level of reliability of the teacher pedagogical competency test instrument is in a very good category.

2) Professional Competence

The professional competency test instrument consists of 50 items.

Table 10. Reliability of Professional Competency Test Instruments

Cronbach's Alpha	N of Items
,810	50

Reliability Statistics

Based on the results of the reliability analysis above, it is 0.810. Obtaining the results of the reliability analysis shows that the level of reliability of the teacher pedagogical competency test instrument is in a very good category.

DISCUSSION

Based on the results of the validation above, the validation values on the instrument are a) 15 items of interview guidelines were valid with a validity index range of 0.883; b) 17 items of valid teacher response questionnaire with a validity index range of 0.877; 50 valid pedagogical competency questionnaires with a validity index range of 0.865, and 40 valid professional competency questionnaires with a validity index range of 0.838. This means that the quality of the Io-JePD model instrument to improve teacher competence can be used properly. Research related to improving the competence of elementary school teachers can be done by preparing instruments with high validation (Suson et al., 2020). Developing instruments to assess teacher competence requires a competent performance model that guides the collection and assessment of the evidence in various tasks. Validation of statements about teacher competence is considered an evaluation of interpretive arguments (Fatmawati et al., 2018). This is following the opinion of Sukadari (Sukadari, 2019) which states that an instrument is good and can be used if it has fulfilled the substantial, construction, and linguistic aspects. This opinion is also confirmed by Setiabudi (Agung Setiabudi, 2019) that a test is said to be valid if it measures something to be measured. Likewise, Admiraal (Polizzi et al., 2019) stated that the validity of the instrument should be meaningful, fair, and transparent.

The results of the reliability analysis above obtained 0.901 for the reliability of the pedagogic competency test instrument and 0.810 for the reliability of the professional competency test instrument, meaning that the quality of the IoJEPD model instrument to improve teacher competence is in the very good category. Research related to improving the competence of elementary school teachers can be done by conducting training and will get good results. This is following the results of research conducted by (Yusnita, 2018) that after attending the training there was an increase in pedagogic competence and teacher performance. This can be seen after taking the training test, the results obtained are 83.74% which is included in the good category. This opinion was also confirmed by (Adegbola, 2019) that after attending the training there was an increase in pedagogic competence and teacher performance. This can be seen after taking the training test, the results obtained are 96.2% which is included in the good category. This opinion also emphasized that the implementation of the training can take place effectively. Training activities by providing a balanced concept and practice. Likewise opinion (Desstya, 2018) that after participating in the training there is an increase in teacher competence (Iivari et al., 2020) (Sokołowska, 2021). It can be seen that after taking the training test, the result is 0.856 which is included in the good category. This opinion also emphasized that the improvement of pedagogic competence through training was carried out by coaching with training activities in the preparation of lesson plans.

CONCLUSION

The validity and reliability of the IoJEPD model instrument which aims to improve the competence of elementary school teachers in this study are valid and reliable. The results showed that 15 points of the guideline showed a validity index of 0.883 and 17 items of teacher responses showed a validity index of 0.877. 50 pedagogical competency questionnaires showed a validity index of 0.865 and 40 professional competencies showed a validity index of 0.838. With Cronbach's Alpha coefficient, the reliability of the pedagogical competency test above is 0.901 and the professional competency test is 0.810. So it can be concluded that the scale is valid and very reliable to measure the professional and pedagogic competence of elementary school teachers.

Suggestion

This study recommends further research to identify teacher competencies through various validated questions. It aims to be able to meet the needs of teachers who are adapted to the conditions in the school. The results of this study are expected to be able to maintain, improve, and renew the quality of teachers in Indonesia sustainably to improve the pedagogic and professional competence of teachers in carrying out their duties as professional educators through various pieces of training.

LIMITATION

This research is limited to only 35 schools in Yogyakarta. This is because the Yogyakarta area shows remote elementary schools, especially in Sleman, Bantul, and Yogyakarta City, in the sample schools.

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