RESEARCH
www.commprac.com
ISSN 1462 2815

TRAINING PROGRAM BASED ON JIGSAW COOPERATIVE MODEL IN DEVELOPING HOLISTIC ASSESSMENT INSTRUMENTS IN INDEPENDENT CURRICULUM IPAS

Fitriyeni[1]*, Zuhdan Kun Prasetyo[2], Rosita Endang Kusmaryani[3] and Syahriadi[4]

[1,2,3]Yogyakarta State University, Indonesia.
[4]Riau University, Indonesia.
*Corresponding Author Email: fitriyeni.2021@student.uny.ac.id

DOI: 10.5281/zenodo.14677651

Abstract

This research is a development research, using the 4D development design. The stages in the 4D development are: 1) define, conduct a needs analysis of the needs of the training program based on the jigsaw cooperative model, 2) design, this stage designs a training program based on the jigsaw cooperative model, 3) develop, this stage develops a draft training program based on the jigsaw cooperative model which is validated by construction and content by experts; then conduct a trial of the training program based on the jigsaw cooperative model with 47 teachers in the experimental class and 25 teachers in the control class using traditional training. The data from the trial results were analyzed using t-test, 4) dessiminate, this stage is carried out dissemination through publication in reputable international journals. The purpose of this study is to develop an effective training program in improving teacher competence in developing holistic assessment instruments in the Merdeka curriculum IPAS. The data analysis technique used is T-Test This analysis uses the help of the SPSS 26.00 program. All tests were conducted at the 5% significance level.The results obtained in the study on t-test data show that there is a significant difference between the experimental class and the control class in improving teacher competence in developing holistic assessments on the IPAS of the Merdeka curriculum. This significant difference shows that the training program based on the jigsaw cooperative model is effective in improving teacher competence in developing holistic assessments in the IPAS of the Merdeka Curriculum.

Keywords: Jigsaw Cooperative Model, Holistic Assessment of Independent Curriculum IPAS, Training Program.

INTRODUCTION

Education is an activity that lasts a lifetime, education is not only obtained from the school environment but can also be obtained from the family environment because the responsibility for education is a shared responsibility between schools, families, communities and governments. The purpose of education for students is as a provision for themselves to obtain a decent livelihood and can instill character attitudes that are in accordance with good values or norms in their environment. In order for education to run with its function, it must be carried out appropriately by all parties related to the progress of education from schools, families, communities, and governments. To see the development of education holistically, an evaluation must be made of the progress of the education program implemented, both in terms of education programs, education systems, and learning. One of the efforts made by schools to see the progress of education at school is to conduct appropriate learning assessments to assess the progress of students.

Assessment is very important in the world of education, especially in schools. The goal is to see the extent of the success of the learning process that can be used by teachers as a guide in improving the learning process, and most importantly for students in describing the achievement of their competencies. Assessment can also be used as

an illustration of the causes of students' failure in learning. If there is an error in retrieving information about students, it will lead to errors in making decisions in evaluating. This is in line with the principles of the independent curriculum, which says assessment should be an integral part of the learning process, help students learn, and provide comprehensive information to help teachers, students and parents determine better learning approaches. Based on Government Regulation Number 21 of 2022, Assessment aims to determine the learning needs and developmental achievements or learning outcomes of students obtained from the process of collecting and processing information. Learner learning outcomes assessment procedures include: (1) formulation of assessment objectives, (2) selection and/or development of assessment instruments, (3) implementation of assessments, (4) processing of assessment results, (5) reporting of assessment results.

Assessment techniques are ways or methods of teachers to obtain information about learning and achievements owned by students, among examples of assessment techniques are using test techniques and non-test techniques (Wildan, 2017). Test assessment techniques are usually used in cognitive assessment and non-test assessment techniques are usually used in attitude and psychomotor assessment. In the assessment should be able to provide a report on the progress of learners holistically, so that the information can be used as feedback for both teachers and learners as knowledge of what has been understood and what has not been understood by learners. But the assessment that is generally carried out is limited to assessing the success of students based on the cognitive domain, the assessment should also be able to examine the readiness of students in participating in learning, the process of students in participating in learning with the aim of providing feedback on the learning carried out, so as to provide the right decision in providing assessment results on the progress of students. Every assessment carried out must be summed up and described so that teachers feel burdened to do so (Fauziah & Alawiyah Tuti, 2016). Furthermore (Subagia, 2016) suggests that there are several problems experienced by teachers in assessment including: related to the number of assessment elements, the complexity of the assessment of making assessment instruments, implementing assessments, and reporting assessment results. In the independent curriculum, the characteristics and needs of learners in education units and regions allow educators and education units to develop learning, teaching tools, and assessments and based on the characteristics of learning objectives, education units and educators can also choose the type, technique, form of instrument, and time of assessment. Assessment and learning should not be separated, so that the entire learning process can achieve competencies so that educators and students must understand the competencies to be achieved. The differences between the 2013 curriculum and the independent curriculum include subject units, lesson hours, learning strategies, learning implementation, graduation standard assessments, assessments in the independent curriculum there are non-cognitive and cognitive assessments (Lestari et al., 2022).

In the learning process and assessment activities cannot be separated and are an interconnected unit with the aim of encouraging the success of students in the classroom. So far, what has happened is that assessment tends to be directed at summative assessment which is used as a student progress report but the results of the assessment have not been used as feedback for learning improvement, this is because there are obstacles in conducting authentic assessment, namely the number

of students who are too many so that the assessment of attitudes and skills is only done casually (Abdillah et al., 2021). Teachers are also constrained in compiling grids and making assessment instruments, in the stage of implementing assessments teachers have difficulty in conducting affective assessments, namely self-assessment and assessment among students, for psychomotor assessments teachers are constrained in using performance and project assessments, while for cognitive teachers are constrained in using written and oral techniques (Nabilah et al., 2021). The success of learning can be realized by establishing learning principles and assessment by the government which serves as a guide for educators in designing and implementing meaningful learning processes so as to create students who are creative, innovative, and think critically. the principles of assessment in the independent curriculum are as follows: (1) education is future-oriented and long-term, facilitates learning, and provides holistic information that serves as feedback for students, educators and parents / guardians to direct in determining the next learning strategy, (2) assessment is designed and implemented based on the function of the assessment, and is given flexibility in determining assessment techniques and time so that learning objectives can be achieved effectively, (3) to explain the learning progress of learners, the assessment is designed fairly, proportionally, valid and reliable as a basis for preparing the next appropriate learning program, (4) it is simple and informative in reporting on learning progress and learner achievement, (5) educators, learners, education personnel and parents can use the assessment results as material for reflection to improve the quality of learning.

Based on the explanation above, assessment should contain assessment for learning, assessment as learning, and assessment of learning. Assessment for learning relates to the assessment carried out in relation to the learning process of learners with the aim of understanding, what can be understood or not understood by learners, while assessment of learning is an assessment carried out by comparing learning targets that have been carried out as a final assessment of learner performance (Berry, 2008). The application of holistic assessment in the independent curriculum is still confusing for teachers in schools, currently summative assessment is still the dominant assessment for teachers in schools, whereas before starting the lesson the teacher must conduct a diagnostic assessment which aims to diagnose the learning needs/readiness of students both cognitively and non-cognitively, then during learning a formative assessment is carried out which is used as feedback in the learning process. Diagnostic assessment can create a good influence on differentiated learning by diagnosing the learning styles of learners (Yani et al., 2023). This assessment is applied to all school levels from elementary to high school. There are curriculum changes in school subjects, such as in elementary school science subjects become IPAS, while at the junior and senior high school levels biology, physics, and chemistry are combined into science subjects. Furthermore, IPAS learning in elementary school is a combined subject between science and social studies, in IPAS contains IPAS understanding and process skills. IPAS understanding is evidence when someone integrates and selects the right scientific knowledge to predict and explain a fact or phenomenon and applies that knowledge in different situations. This scientific knowledge relates to concepts, facts, laws, principles, models, theories and has been established by scientists. Process skills are intentional processes to diagnose situations, formulate problems, criticize experiments and find differences between alternatives, design research, find information, create models, debate peers using facts, and form coherent arguments (Kemendikbud, 2017).

The results in the field also show that in designing IPAS assessments, especially in taking practical values, such as practicum activities, teachers also experience difficulties in designing assessment instruments, because IPAS learning also requires process skills, so it is important to provide training on teacher understanding in designing practicum assessment instruments. There are 5 obstacles experienced by teachers, including: suitability of research instruments, limited time, large number of students, different student characters, and adequate facilities / infrastructure (Zakia, 2021). Teachers have difficulty in conducting performance and project assessments due to teachers' lack of understanding and uneven training (Nabilah et al., 2021b). Furthermore, research conducted by (Susiyawati et al., 2019) shows that most science teachers are not yet skilled in preparing skills assessments, especially in making grids, implementation instructions and assessment rubrics.

Based on the results of the need assessment that has been carried out in Pekanbaru city, it shows that educators need training related to the independent curriculum, namely 61.69% of teachers strongly agree that training is needed, especially in designing and making assessment instruments based on the independent curriculum. The majority of assessment training on the independent curriculum has also never been received by schools in Pekanbaru City. Currently, formative assessment is highly emphasized with the aim of providing feedback on the learning process, so that 64.3% of teachers in Pekanbaru city strongly agree that training is needed to design and make holistic assessments. It is clear based on these studies, and based on the need assessment that has been carried out that holistic assessment cannot be fully implemented by teachers in accordance with the demands of the independent curriculum, this is due to the limited understanding of teachers of holistic assessments such as diagnostic, formative, and summative assessments, then the absence of teacher time to compile non-test instruments related to affective and psychomotor assessments, the unavailability of standardized assessment formats for affective assessments. The results of this need assessment are in line with research that has been conducted on the implementation of the independent curriculum, that teachers are in the sufficient category in understanding the implementation of the independent curriculum, especially in designing assessments in the independent curriculum (Gusmawan & Herman, 2023). Further problems are lack of funds to conduct training, unprepared teachers in conducting training, process and assessment. The results of the studies that have been conducted indicate the need for improvements in teacher training programs, including improvements in the use of training models used in training programs, should not use traditional approaches, use interactive methods, namely with the involvement and cooperation of teachers in training programs and reflective learning, by directing training programs that are generally trainer-centered to become trainer-centered to become trainer-centered. Based on the results of these studies, the use of learning models in training programs is important to maximize the improvement of competence and motivation of trainees.

Research on training programs that use learning models has been carried out previously, including training programs that utilize learning models in training teachers' competencies, including research with the title, reflective design-based learning model (BDR) to improve elementary school teachers' technology, pedagogy and material mastery (TPACK) skills in science learning, producing products in the form of reflective design-based learning models that are feasible, effective and practical in improving elementary school teachers' TPACK in science learning (Kumala, 2022). Training

programs using the STEAM model show that teachers are successful in collaborating to share lessons and implement them into their learning, and can make teachers accountable to their groups (Boice et al., 2021). Based on this, it can be continued by using the learning model into the training program. To produce a training program that can create collaboration between trainees, a sense of responsibility, make trainees become active and understand the material in depth in training activities. This is because the advantages of the jigsaw cooperative model is one of the learning models that involves cooperation in groups so that it can collaborate in improving the understanding of teachers or prospective teachers. Jigsaw cooperative is a learning model that consists of groups of origin and expert groups. Jigsaw learning is first based on the perspective that each student will become an "expert" in a small part of the overall learning material, then teach other students in his group this part of the material (Tran & Lewis, 2012). Furthermore, research with the title The Effects of Using Jigsaw Method Based on Cooperative Learning Model in the Undergraduate Science Laboratory Practices, this study is to see the effect of the jigsaw model on the achievement of prospective science teachers with the results can improve understanding of physics concepts (Karacop, 2017). Furthermore, research by (Halimah & Sukmayadi., 2019) explored the role of the jigsaw model on the understanding of prospective teachers, showing success in increasing pedagogical knowledge and verbal communication skills of prospective teachers.

Research that has been conducted on the application of the jigsaw cooperative model to prospective teachers to improve the competence of prospective teachers, thus making researchers will apply the jigsaw cooperative model to the training program that will be conducted for elementary school teachers in Pekanbaru City to improve teacher competence in developing holistic assessment instruments in the independent curriculum. This is because the jigsaw cooperative model is suitable for adult learning. There is an effect of increasing student learning outcomes by using the jigsaw cooperative model (R. S. Lubis, 2021). Furthermore, it can improve students' pedagogical abilities (Khoirin Nashiroh et al., 2020). Can increase student motivation and learning outcomes (Nopiyanto & Raibowo, 2020). Increase student activeness and reading skills (Darmuki et al., 2019). Thus, the use of the jigsaw cooperative model can improve pedagogical competence, motivation, learning outcomes, and even activeness and skills. The jigsaw cooperative model can also be understood by teachers who are given training on this jigsaw cooperative model (Asad et al., 2023). The use of the jigsaw cooperative model has not been found to be applied in teacher training programs. Based on the results of previous research, it shows that the jigsaw cooperative model can be used in adult learning, so researchers will try to use the jigsaw cooperative model in the training program. The training program that has been implemented so far is still centered on the trainer rather than the trainees. So from this explanation, the researcher raised the title of the training program based on the jigsaw cooperative learning model in developing holistic assessment instruments in the independent curriculum IPAS. The use of the jigsaw cooperative model in this training program is of course expected to be able to improve the competence of training participants (teachers), as well as a training program that can make training participants active and motivated in participating in training. Increased teacher competence will certainly be able to provide good performance for schools and especially for students.

METHODS

This research is a development research. In this case, what is developed is a training program in developing holistic assessment instruments in IPAS learning in elementary schools. The design in this study is the research and development (R & D) method of the 4D model which consists of four stages, namely define, design, develop, disseminate (Thiagarajan, 1974). In the initial stage of the define analysis, there are requirements for the implementation of training, including analyzing problems in the field by taking a need assessment, analyzing training strategies, analyzing curriculum, analyzing training participants and analyzing tasks. At the design stage, a training program based on the jigsaw cooperative model was designed in the development of holistic assessment instruments in the independent curriculum IPAS which resulted in a draft training program based on the jigsaw cooperative model and expert assessment sheets. The development stage produces a training program. The stages in development consist of expert appriation, development trials. Then the last stage is dissemination. At this stage, referring to the results of the training program trials that are significantly able to meet the needs, the dissemination of the training program is carried out by producing an ISBN book and will be disseminated to the KKG group of elementary school teachers.

Data collection techniques were carried out with steps, namely (1) questionnaires used for expert validation in the FGD forum, as well as to see the practicality of the training program in the first trial, (2) tests, used to assess changes before and after the implementation of the training program in the second trial, and in the third trial to see the effectiveness of the training program conducted in the operational trial. Data analysis techniques in this study were analyzed quantitatively and qualitatively. The analysis aimed to analyze the feasibility, practicality and effectiveness of the training program. To prove the effectiveness of the jigsaw cooperative-based training program in the control class and experimental class. In the control class, traditional training was conducted, namely the lecture method with a total of 30 teachers. In the experimental class, a jigsaw cooperative lecture-based training program was conducted with a total of 30 teachers. The analysis used was T-Test. A significance number smaller than 0.05 indicates if H0 is rejected, which means there is a difference in the dependent variable between groups. This analysis used the help of the SPSS 26.00 program. All tests were conducted at the 5% significance level.

RESULT AND DISCUSSION

This research on the development of training programs based on the jigsaw cooperative model uses the 4D model development steps. These steps are systematic stages in developing the product. The steps taken at the product development stage are as follows:

1. Definition

At this stage, a needs analysis was carried out using a questionnaire distributed via google form and also directly, the questionnaire was distributed in schools in Pekanbaru City. The questionnaire was filled in by 71 teachers spread across several sub-districts including: Bukit Raya District, Tampan District, Marpoyan Damai District, Pekanbaru City District, Rumbai Pesisir District and Tenayan Raya District. Based on the findings of the need assessment in the field, the solution is to provide learning/training for teachers in Pekanbaru City. The following is the need assessment

data that has been conducted in Pekanbaru City that 64.3% of teachers strongly agree to conduct training and 35.7% agree to conduct training:

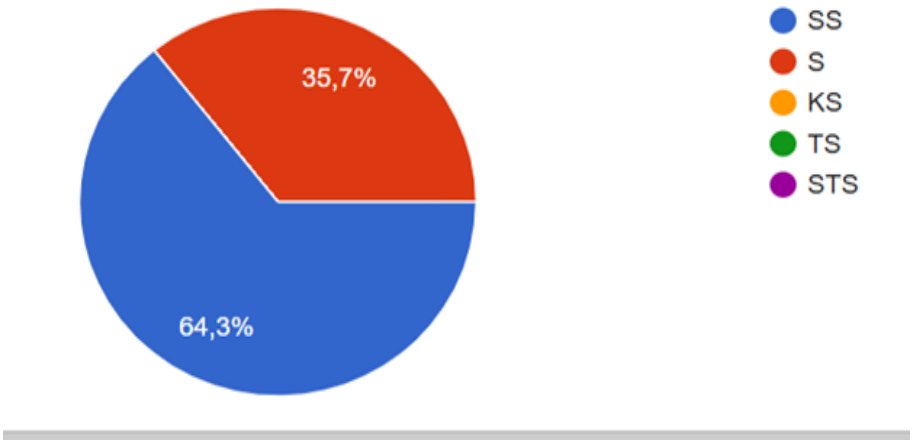

Figure 1: Teacher training needs data

From the description previously presented, the training program developed uses a jigsaw cooperative learning model, which is expected to increase the competence of teachers in Pekanbaru city in developing holistic assessment instruments in the independent curriculum IPAS.

2. Design

The training design based on the jigsaw cooperative model is outlined in the product in the form of a module for trainees contained in the module developed based on the results of the needs that have been done before. The module design is based on andragogy theory and jigsaw cooperative model theory. Andragogy theory defines learning for adults, as stated by (Hiryanto, 2017) that andragogy is a science that examines how to guide adults in the learning process. The module produced in this research has fulfilled how to teach adults because the module is produced based on adult learning needs seen from need assessment data so as to make adults (teachers) able to develop their competence, knowledge and skills, as an effort to improve their professionalism. The jigsaw cooperative model is a learning model that emphasizes the active involvement of participants, cooperation, participants can express their ideas in group discussions, each participant is given responsibility in terms of understanding the material that has been given to teach their group members so that their opinions will be valued or appreciated, so as to provide experience to participants not only in the form of receiving material.

3. Development

This stage is the stage of producing training program development products in the form of trainee modules. Before the product is validated by experts, the assessment instrument is validated first by the validator. This expert assessment aims to get suggestions and improvements by experts in their respective fields. The assessment carried out by the expert both the instrument and the product produced is then made improvements in accordance with the expert's suggestions. So that the instruments and products produced are effective in accordance with the research objectives. Based on the results of the validation carried out on the trainee module, the validator assessed the validity of the trainer module produced. With the conclusion that the

training program is feasible to use with revision. Module validation consists of expert validation and empirical validation. Which can be explained as follows:

1) Expert validation

Validation of the pretest posttest test questions was carried out by experts in the field of learning evaluation. The results of the validation of the question are declared suitable for use. The following are the results of validation by validators:

Table 1: Question validation

Variables	Indicator	Yes
Development of holistic assessment instruments in the independent curriculum ipas	1. Translate learning outcomes into learning objectives	V
	2. Explain the meaning of diagnostic, formative, and summative assessment	V
	3. Design holistic assessment of independent curriculum	V

2) Empirical validation

After expert validation, the question instrument is followed by an empirical test to determine the validity and reliability of the question instrument. Empirical validity was carried out in one school, namely at SDIT Almadinah with 15 teachers. The valid data analysis is as follows:

Table 2: Empirical validity

Correlations								
		B1	B2	B3	B4	B5	B6	JUMLAH
B1	Pearson Correlation	1	,141	-,009	,415	,328	,457	,624*
	Sig. (2-tailed)		,615	,974	,124	,232	,086	,013
	N	15	15	15	15	15	15	15
B2	Pearson Correlation	,141	1	,460	,221	,137	-,027	,569*
	Sig. (2-tailed)	,615		,085	,428	,627	,923	,027
	N	15	15	15	15	15	15	15
B3	Pearson Correlation	-,009	,460	1	-,220	,387	-,446	,280
	Sig. (2-tailed)	,974	,085		,430	,155	,096	,312
	N	15	15	15	15	15	15	15
B4	Pearson Correlation	,415	,221	-,220	1	,126	,651**	,691**
	Sig. (2-tailed)	,124	,428	,430		,654	,009	,004
	N	15	15	15	15	15	15	15
B5	Pearson Correlation	,328	,137	,387	,126	1	,180	,625*
	Sig. (2-tailed)	,232	,627	,155	,654		,520	,013
	N	15	15	15	15	15	15	15
B6	Pearson Correlation	,457	-,027	-,446	,651**	,180	1	,591*
	Sig. (2-tailed)	,086	,923	,096	,009	,520		,020
	N	15	15	15	15	15	15	15
TOTAL	Pearson Correlation	,624*	,569*	,280	,691**	,625*	,591*	1
	Sig. (2-tailed)	,013	,027	,312	,004	,013	,020	
	N	15	15	15	15	15	15	15
*. Correlation is significant at the 0.05 level (2-tailed).								
**. Correlation is significant at the 0.01 level (2-tailed).								

Based on the validity data, the question is declared valid if the significance value <0.05. From the data there is one invalid question, namely question no. 3. Because the significance value> 0.05. So the question is concluded to be invalid. Apart from being tested for validity, the test reliability test was also carried out. The data on the reliability test results are as follows:

Table 3: Reliability

Reliability Statistics	
Cronbach's Alpha	**N of Items**
,863	6

Determination of reliability is with the provisions of being at a value of 0.80-1.00. Based on the data obtained, the question was declared reliable because the Cronbach alpha value was 0.863. After getting valid results, a development trial was carried out. Stage 1 development trials were carried out with the aim of seeing the practicality of the products produced. Stage 2 tests were carried out to see the effect before and after treatment using the products produced. The stage 3 test was carried out to see the effectiveness of the resulting product. At the end of each trial, revisions were made according to the input. The first trial stage concluded that the teachers' responses to the training program based on the jigsaw cooperative model were very practical. The second trial stage was conducted to determine the changes before and after the implementation of the training program based on the jigsaw cooperative model. The trial was conducted at DSN 120 Pekanbaru which consisted of 16 teachers. The results of this trial activity can be seen in the following table:

Table 4: Data results of pretest and posttest averages

One-Sample Statistics				
	N	**Mean**	**Std. Deviation**	**Std. Error Mean**
pretes	16	35,63	10,494	2,623
postes	16	83,06	10,247	2,562

The statistical test results show that there is an average difference between the pretest and posttest average scores. The average pretest score was 35.63 and the average postest score was 83.06. There is an increase in learning outcomes of training program participants with an increased understanding of the independent curriculum assessment material. Infernial analysis was also carried out in this study, the statistics used were parametric statistics. The purpose of this analysis is to fulfill the assumption that the data is normally distributed. The following is a table of normality test data:

Table 5: Data normality test results

Tests of Normality						
	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
pretes	,211	16	,055	,877	16	,351
postes	,193	16	,114	,848	16	,132
Lilliefors Significance Correction						

Based on the normality test data, the sample of 16 teachers using Shapiro-Wilk because the sample size is less than 50 shows a significance value of 0.351> 0.05, meaning that the data is normally distributed. After the prerequisite test is met, proceed with the aired Sample T-Test analysis. T-Test data analysis can be seen in the following table:

Table 6: Results of data analysis of sample T - Test

One-Sample Test						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
posttest	31.352	15	.000	78.760	73.58	83.94
pretest	15.954	15	.000	35.400	30.82	39.98

Based on the table above, the Sig value. (2-tailed) 0.000 <0.05. Based on the results of the T-Test test if the Sig (2-tailed) value <0.05, the training program based on the jigsaw cooperative model is significant in improving teacher competence. Based on the interpretation of the effectiveness of the Normalized Gain (%) which is 97.71%, it is concluded that the training program based on the jigsaw cooperative model is very effective. For more details can be seen in the table below:

Table 7: Descriptive statistic

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Ngain_score	16	,39	1,78	,9771	,40661
Ngain_persen	16	38,89	177,78	97,7147	40,66117
Valid N (listwise)	16				

After obtaining the value results from the 1st and 2nd trials, the 3rd trial was carried out to determine the difference between the experimental and control classes. The experimental class was the class with the application of the jigsaw cooperative-based training program, while the control class used conventional training. The experimental class was tested at the teachers' working groups (KKG) in Rumbai and Rumbai Barat sub-districts of Pekanbaru city, while the control class was conducted at SDN 105 Pekanbaru. The experimental class consisted of 47 teachers, while the control class consisted of 25 teachers. Pekanbaru which consisted of 16 teachers. The results of this pilot can be seen in the following table:

Table 7: Average results of experimental and control classes

Group Statistics					
	kelas	N	Mean	Std. Deviation	Std. Error Mean
Ngain_persen	eksperimen	47	72,88	13,725	2,002
	kontrol	25	54,83	12,848	2,570

The statistical test results show that there is an average difference between the experimental class and the average value of the control class. The average experimental score was 72.88 and the average control class score was 54.83. There is a difference in learning outcomes between the experimental and control classes. Based on the interpretation of the effectiveness of Normalized Gain (%), it can be concluded that the training program based on the jigsaw cooperative model is quite effective with a mean of 72.88 or 72.88% when compared to conventional training, which is with a mean of 54.83 or 54.83% with a less effective category. So it can be concluded that the experimental Gain is more effective than the control class.

Table 8: T - Test Gain of experimental and control

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Ngain_persen	Equal variances assumed	,310	,579	5,427	70	,000	18,042	3,325	11,411	24,673
	Equal variances not assumed			5,539	51,985	,000	18,042	3,257	11,506	24,579

Based on the table above, it is known that the Sig value on Levene's test for equality of variances is 5.427> 0.05, it can be concluded that the variance of the Normalized Gain (%) data for experimental and control data is the same or homogeneous. Thus, the independent t test for Normalized Gain (%) is guided by the Sig value found in the equal variance assumed table. Based on the independent sample test table, it is known that the Sig (2-tailet) value is 0.000 <0.05, thus Ho is rejected, it can be concluded that there is a significant difference in effectiveness between the training program class based on the jigsaw cooperative model and the conventional class.

3. Dessiminate

The dessiminate stage is carried out by disseminating the resulting product to teachers to be used in developing assessment instruments in the independent curriculum IPAS.

CONCLUSION

This research has produced a jigsaw cooperative-based training program in the form of a training module for participants that has been tested in terms of its feasibility. This training program was produced based on the concept of andragogy theory, namely how to teach adults. Andragogy is an adult learning process in which learning will run well if learning methods and techniques involve training participants (Ummah, 2019). Based on the findings of the research results and has been done, the conclusion of this study produces a training program that is able to improve teacher competence effectively. This training program was designed using the jigsaw cooperative learning model.

The jigsaw cooperative model is a learning model that can make participants actively involved and responsible for their respective tasks. This principle is very suitable for adult learning in accordance with the concept of andragogy theory. The effectiveness of the training program based on the jigsaw cooperative model has a significant difference between the experimental and control classes. The jigsaw cooperative model is suitable for use in adult learning, because the jigsaw cooperative learning model can accommodate learning that facilitates adults in active learning, not passive learning, where they only receive learning from trainers or tutors. Thus, cooperative learning can be implemented in training programs, which have been proven by researchers to be valid.

References

1) Abdillah, F., Sulton, S., & Husna, A. (2021). Implementasi Penilaian Autentik Dalam Kurikulum 2013. *JKTP: Jurnal Kajian Teknologi Pendidikan*, *4*(1), 41–50. https://doi.org/10.17977/um038v4i12021p041.

2) Adnyana, K. S. (2023). Penilaian Bahasa Indonesia Dalam Kurikulum Merdeka. *Stilistika : Jurnal Pendidikan Bahasa Dan Seni*, *11*(2), 343–359. https://doi.org/10.59672/stilistika.v11i2.2849.

3) Akbar, J. S., Dharmayanti, P. A., Nurhidayah, V. A., Lubis, S. I. S., Saputra, R., Sandy, W., Maulidiana, S., Setyaningrum, V., Lestari, L. P., Ningrum, W. W., Astuti, N. M., Nelly, Ilyas, F. S., Ramli, A., Kurniati, Y., & Yuliastuti, C. (2023). *Model dan Metode Pembelajaran Inovatif (Teori dan Panduan Praktis)* (Vol. 1).

4) Astri Fifani, N., Islam Negeri Mahmud Yunus Batusangkar Batusangkar, U., & Barat, S. (2023). Analisis Kesulitan Guru Dalam Penerapan Kurikulum Merdeka Di Sd Kota Batusangkar. In *dkk. Jurnal Pendas Mahakam* (Vol. 8, Issue 1).

5) Anderson L, & Krathwohl D. (2001). *A taxonomy for learning teaching and assessing_ a revision of Bloom`s taxonomy of educational objetives (2001, Longman) - libgen.li*.

6) Arends, R., & Kilcher, A. (2010). *Teaching for Student Learning Becoming an Accomplished Teacher*.

7) Asad, A., Ananto, I., Fatimah, F., & Thertina, E. (2023). Pelatihan Pembelajaran Koorperatif Metode Jigsaw di Sekolah Menengah Pertama (SMP) Muhammadiyah 17 Ciputat Timur Tangerang Selatan. *Darma Cendekia*, *2*(1), 20–25. https://doi.org/10.60012/dc.v2i1.37

8) Balbay, S., Pamuk, Ġ., Temir, T., & Doğan, C. (2018). Journal Of Language And Linguistic Studies Issues in pre-service and in-service teacher training programs for university English instructors in Turkey. In *Journal of Language and Linguistic Studies* (Vol. 14, Issue 2). www.jlls.org

9) Boice, K. L., Jackson, J. R., Alemdar, M., Rao, A. E., Grossman, S., & Usselman, M. (2021). Supporting teachers on their STEAM journey: A collaborative STEAM teacher training program. *Education Sciences*, *11*(3), 1–20. https://doi.org/10.3390/educsci11030105.

10) Briggs, M., Woodfield, A., Martin, C., & Swatton, P. (2009). *Assessment for Learning and Teaching in Primary Schools Second edition*.

11) Colosi, J. C., & Zales, C. R. (1998). Jigsaw cooperative learning improves biology lab courses. In *BioScience* (Vol. 48, Issue 2, pp. 118–124). Oxford University Press. https://doi.org/10.2307/1313137

12) Darmuki, A., Hariyadi, A., Pendidikan Bahasa dan Sastra Indonesia, P., & Pendidikan Kewarganegaraan, P. (2019). *peningkatan keterampilan berbicara menggunakan metode kooperatif tipe jigsaw pada mahasiswa pbsi tingkat i-b ikip pgri bojonegoro tahun akademik*.

13) Kumala, N. F. (2022a). *Model pembelajaran berbasis desain reflektif (bdr) untuk meningkatkan kemampuan teknologi, pedagogi, dan penguasaan materi (tpack) guru sd dalam pembelajaran ipa*.

14) Kumala, N. F. (2022b). *Model Pembelajaran Berbasis Desain Reflektif (Bdr) Untuk Meningkatkan Kemampuan Teknologi, Pedagogi, Dan Penguasaan Materi (Tpack) Guru Sd Dalam Pembelajaran IPA*.

15) Laulita, U., Marzoan, Hamzar, S., & Utara, L. (2022). *Jurnal Pendidik Indonesia* (Vol. 5, Issue 2).

16) Lestari, A., Qadri, M. AL, Hasibuan, M., Jam, S., & Mahmudiyah Tanjung Pura Langkat, iyah. (2022). Implementasi Penilaian Autentik Kurikulum Merdeka Dalam Menumbuhkan Pendidikan Karakter Mata Pelajaran Akidah Akhlak Siswa Kelas X MAN 1 Langkat. In *ALACRITY : Journal Of Education* (Vol. 2, Issue 3). http://lpppipublishing.com/index.php/alacrity.

17) Lubis, N. A., & Harahap, H. (n.d.). Pembelajaran Kooperatif Tipe Jigsaw. In *Jurnal As-Salam* (Vol. 1, Issue 1).

18) Mukhibin, A., & Nafidhoh, B. (2023). Hambatan Guru Matematika dalam Mengimplementasikan Kurikulum Merdeka: Systematic Literature Review. *Jurnal Ilmiah Pendidikan Matematika Al Qalasadi*, *7*(2), 127–137. https://doi.org/10.32505/qalasadi.v7i2.7152

19) Nabilah, N., Karma, I. N., & Husniati, H. (2021a). Identifikasi Kesulitan Guru dalam Melaksanakan Penilaian Autentik pada Kurikulum 2013 di SDN 50 Cakranegara. *Jurnal Ilmiah Profesi Pendidikan*, *6*(4), 617–622. https://doi.org/10.29303/jipp.v6i4.298

20) Nabilah, N., Karma, I. N., & Husniati, H. (2021b). Identifikasi Kesulitan Guru dalam Melaksanakan Penilaian Autentik pada Kurikulum 2013 di SDN 50 Cakranegara. *Jurnal Ilmiah Profesi Pendidikan*, *6*(4), 617–622. https://doi.org/10.29303/jipp.v6i4.298

21) Nauman Ahmed, H., Rizwan Pasha, A., & Malik, M. (2021). *The Role of Teacher Training Programs in Optimizing Teacher Motivation and Professional Development Skills* (Vol. 43, Issue 2).

22) Nopiyanto, Y. E., & Raibowo, S. (2020). Penerapan model pembelajaran Jigsaw untuk meningkatkan motivasi dan hasil belajar mahasiswa penjas pada mata kuliah filsafat penjas dan olahraga. *Journal Of Sport Education (JOPE)*, *2*(2), 61. https://doi.org/10.31258/jope.2.2.61-69

23) Nugraha, F. (2020). *Pendidikan Dan Pelatihan Konsep dan Implementasi dalam Pengembangan Sumberdaya Manusia*. Litbangdiklat press.

24) Nurdiansyah, & Fahyuni, F. E. (2016). *Inovasi Model Pembelajaran* (1st ed.). NIzamia Learning Center.

25) Nurfuadi. (2019). *Manajemen Kompetensi Guru dalam Peningkatan Mutu Pembelajaran* (R. Hadi & A. Purnomo, Eds.). Stain Press. www.stainpress.com

26) Nzarirwehi, J., & Atuhumuze, F. (2019). *In-Service Teacher Training and Professional Development of Primary School Teachers in Uganda*.

27) Putu Agus Adi Saputra, I., Nyoman Jampel, I., & Wayan Suwatra, I. I. (2021). Pengembangan Instrumen Penilaian Kompetensi Pengetahuan IPA Siswa Sekolah Dasar. *Journal for Lesson and Learning Studies*, *4*(1), 13–19.

28) Suryani, N., Herpratiwi, H., & Adha, M. M. (2023). Pengembangan Instrumen Penilaian Sikap Sosial pada Pembelajaran Tematik di Sekolah Dasar. *Jurnal Basicedu*, *7*(1), 474–482. https://doi.org/10.31004/basicedu.v7i1.4463

29) Surya, Pratama, D., Khaq, M., & Ngazizah, N. (2022). Peningkatan Keaktifan dan Hasil Belajar Materi Gaya melalui Model Kooperatif Tipe Jigsaw. *Journal on Teacher Education*, *4*(2), 213–221.

30) Susiyawati, E., Widodo, W., Nurul Hidayati, S., Ipa, J., Mipa, F., Negeri Surabaya, U., & Ketintang, J. (2019). *Analisis kemampuan guru ipa dalam melakukan penilaian keterampilan*.

31) Tran, D. Van, & Lewis, R. (Rom). (2012). The Effects of Jigsaw Learning on Students' Attitudes in A Vietnamese Higher Education Classroom. *International Journal of Higher Education*, *1*(2). https://doi.org/10.5430/ijhe.v1n2p9

32) Tregón-Martín, N., Valero Valero, M., Flores Builes, R., & Caballer Miedes, A. (2021). Educational guidance for functional visual diversity in Nicaragua. Design and evaluation of a teacher-training program. *Evaluation and Program Planning*, *88*. https://doi.org/10.1016/j.evalprogplan.2021.101948

33) Waspodo M. (2019). *Penilaian Hasil Belajar* (1st ed.). Kementerian Pendidikan dan Kebudayaan Badan Penelitian dan Pengembangan Pusat Penelitian Kebijakan Pendidikan Dan Kebudayaan 2019.

34) Yani, D., Muhanal, S., & Mashfufah, A. (2023). Implementasi Assemen Diagnostic Untuk Menentukan Profil Gaya Belajar Siswa Dalam Pembelajaran Diferensiasi Di Sekolah Dasar. *Jurnal Inovasi Dan Teknologi Pendidikan Jurinotep*, *1*(3), 241–360. https://doi.org/10.46306/jurinotep.v1i3

35) Yustiana, S., & Ulia, N. (2019). Pengembangan Instrumen Penilaian Diri Berbasis Pembelajaran Kontekstual. *Profesi Pendidikan Dasar*, *1*(2). https://doi.org/10.23917/ppd.v1i2.8998.