

Comparison of cognitive and improvisational learning models on music students' learning

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ABSTRACT: The cognitive learning model is a form of learning theory called a conceptual model. Meanwhile, improvisation is an activity that encourages the generation of spontaneous responses in a variety of situations. The purpose of this study is to investigate a better learning model used between the cognitive learning model and improvisational learning model. The research methods included a quasi-experimental approach with non-randomised control group pretest and post-test design. The sample in this research are 115 students. Data was analysed using *t*-tests. The results of this study are: (1) learning music with a cognitive learning model demonstrates effective use; (2) learning music using an improvisational model also demonstrates effective use; (3) there is a significant difference in student improvement between the cognitive and the improvisational learning models; (4) the improvisational learning model is more effective than the cognitive learning model for improving the outcome results of music students.

1 INTRODUCTION

Education is one of the most important fields to note because education is the basis for the formation of civilised human beings. Education also has an important role to play in the progress and development of a nation, such that education outcomes serve as benchmarks in evaluating the progress of a nation. To achieve the appropriate learning outcomes of a standard education, what is required are appropriate learning strategies. The effective teaching of learning strategies helps teachers provide assistance so that students can achieve learning goals. Thus, it is necessary to develop the quality of education and learning processes in a sustainable manner in all aspects of learning. If the learning process is not optimal then the quality of education and learning will decrease.

Art education is actually a part of basic education along with language. If art is one form of culture, then art should be taught in ways that align with exact teaching and language learning methods. At present, art education in Indonesia is still limited in its role as being complementary to the required curricula. Art education is not prioritised compared to exact or language learning, thus impacting on the number of teaching hours devoted to art and culture, which are very minimal in the schools. This indirectly impacts on the quality of the students, and art appreciation by the students is very lacking. Less teaching hours in art education also results in a less effective delivery of teaching and learning activities. Many of the factors that contribute to low levels of teaching music in schools are not profound. Teachers lack sufficient numbers of music teaching hours, lack school facilities to teach music and some teachers lack creativity in delivering music materials. The subject of music consists of theory and practice, so a model is required that combines both practice and theory with efficient time for both kinds of endeavours. The model of cognitive learning emphasises the process of thinking and can encourage mastering theories that will be applied to the practice of playing music. Students can apply theories related to the material used for music practice. Students can be freed to look for tools that support the material. Thus, when the practice material is completed

students are also equipped with theories that support the practice, and as expected, students will achieve good learning outcomes.

In addition to the cognitive learning model, one of the other effective learning models for music education for students to achieve good learning outcomes is the improvisational learning model. The improvisational model is a model that emphasises practice. Students are given practical materials first. Thus, the students are expected to understand theories applied to practice materials, with teachers as facilitators of student practice using an improvisational model. In this model, teachers are expected to master the material and musical instruments used in practice sessions that would hopefully produce maximum learning outcomes. This research was conducted to compare the cognitive learning model and the improvisational model in music subjects and to determine which model is better in improving learning outcomes in music education. This research is conducted in SMA N 1 Way Jepara, East Lampung regency.

2 RELATED WORKS/LITERATURE REVIEW

The term 'cognitive' comes from the word 'cognition', which means 'understand' or 'understanding'. Broad understanding is the defender, the arrangement and the use of knowledge that contains the process of thinking (Anwar, 2017). Awareness is a general concept that includes all concepts. These concepts include seeing, watching, giving, thinking, reading, estimating, considering, speaking and judging. The term 'cognitive' is related to the ability to think, including the ability to memorise. Cognitive abilities comprehend appearances that can be used as results, or refers to the process of learning knowledge through one's own experience. The cognitive learning model is oriented towards thinking ability, which includes intellectual abilities, remembering, and problem-solving skills that require students to connect and combine several ideas, methods or procedures to solve problems. Lemut et al. (2013) say that conceptual strategies in the cognitive domain include behavioural solutions to problems, analysis, structuring, concepts and solutions.

The cognitive learning model is a form of learning theory called a conceptual model. The cognitive learning model is a learning model that emphasises the very important internal processes, the denominations of behaviour, including learning that is always occurring or the actions taken as part of behavioural learning. In the student cognitive learning model there is a reflection on the meaning of information they receive by using their own words. As described by Leighton and Gierl (2012), cognitive models are simple descriptions of human problems, taken on by tasks that fulfil educational standards and that help to characterise knowledge and skills at different levels. Ultimately, the cognitive learning model prioritises the development of shared knowledge and values in each student.

Bhinnety (2008) explained that human memory has at least three components, namely the sensory register, working memory (short-term) and long-term memory. Cowan (2014) argues that the development of learning and cognitive education is based on memory. In the cognitive learning model, the teacher provides the basics of the material that is taught for student development and the continuation is left to the students to remember the material. The teacher's duty is to monitor, organise and explain the flow of materials that has been given. In this way, the cognitive learning model helps students to maximise their memories to remember the materials that have been given. To be able to understand and always remember the concepts given to students, the teacher should give emphasis to repeating or reviewing past materials that have been given so that what is received by students can enter into the long-term memory as a model of cognitive learning.

Improvisation is an activity that encourages the generation of spontaneous responses in a variety of situations. Improvisation is a mindset for organisational analysis and in general improvisation works to foster active, initiative, creative and innovative power. Improvisation can also sharpen creativity, imagination and skill in playing arts in a spontaneous way. Djohan (2009) says that the essence of music is good hearing and educational experiences that include a series of performance activities to strengthen and facilitate the wide development and understanding of various musical skills. In Indonesia, Curriculum 13 emphasises

integrated thematic learning. Astuti et al. (2018) suggest that there are three important aspects in the development of integrated thematic teaching. First, there must be integration of subject matter and character education. Second, there must also be integration of theory and practice. Finally, the teaching process should be fun.

The improvisational model is very supportive of Curriculum 13 because there is character education and there is the integration between theory and practice. Theory and practice are applied into a more easily understood way, so the students do not run with their own practice and theories themselves. Improvisation is also certainly fun because students are free to express what is on their minds and is certainly different from memorising and reading. In improvisation there must be creativity because cultural improvisation is related to creativity. According to Beckstead (2001), improvisation is a far more creative attempt to see how far the creative part of the brain is accessed. If the goal is to involve students in accessing and training the 'creative' part of the brain then there is no need to worry about how good the students' improvisational skills are. Improvisation can also increase cohesiveness and cooperation, innovation and performance in teams.

Music improvisation means playing music without preparation, and can teach students how to adjust to changing circumstances spontaneously by hearing and playing music. Djohan (2009) says that learning music through the ears (hearing) and improvisation are important to achieving success. Playing music spontaneously is one of the learning processes. Azzara (1999) says that the best way to learn music and to further know about music is by playing it.

In the model of improvisational learning, the students are given practice materials first. Thus, the students are expected to understand the theories used in the practice materials. In the improvisational model the teacher is a facilitator and guides student practice. In this model, the teacher is expected to help students master the material and musical instruments that will be used, hopefully producing maximum learning outcomes.

3 MATERIAL & METHODOLOGY

3.1 Data

This research was conducted on the students of class X SMA N 1 Way Jepara. The sample population in this research are 115 students. Data collection techniques include using a comparative approach with paired samples (sample related). Paired samples are samples that are subjected to pretest and post-test evaluations. In this study, data collection is divided into two groups, namely one student class that uses a cognitive learning model and another class that uses an improvisational learning model. Both classes were pretested to measure the students' prior abilities and then subjected to a post-test to measure the outcomes of the research. The data collection instrument was a multiple-choice question-set test instrument with four possible answers prepared, based on a grid of questions that adhere to the content standards in the 2013 curriculum (K13). This test was used to evaluate student learning outcomes before and after the applied models of cognitive learning and improvisation.

3.1.1 Normality Test

As a condition of data analysis using a *t*-test, the data must have normal distribution and be a homogeneous variant. Test normality was determined using the Kolmogorov-Smirnov test because the number (*n*) is greater than 30 (large sample). The data is considered to be normally distributed if the significance is greater than 0.05. The research data that was produced was conducted via a normality test:

- a) data for learning outcomes based on the cognitive learning model.
- b) data for learning outcomes based on the improvisational learning model.

The results of the normality tests can be seen in Tables 1 and 2.

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Table 1. Results of normality test for the cognitive learning model.

		Kolmogorov-Smirnov		
Cognitive learning model		Statistic	df	Sig.
Cognitive	Pretest	.096	55	.200
	Post-test	.110	55	.092

Table 2. Results of normality test for the improvisational learning model.

		Kolmogorov-Smirnov		
improvisational model		Statistic	df	Sig.
Improvisational	Pretest	.091	60	.200
	Post-test	.095	60	.200

From the results of data analysis, the data has met the normal assumption of pretest value of 0.200 and the post-test value of 0.092. The significance values of 0.200 (>0.05) for pretest and 0.092 (>0.05) for post-test means it can be tested further.

From these results, the data is considered normal. Pretest and post-test significance data is 0.200. Because the significance value of 0.200 is above 0.05, the data is eligible for further testing.

3.1.2 Homogeneity Test

The homogeneity test is used to test the similarity of variance between the two groups. The homogeneity test uses the F or Levene's test. For homogeneity analysis, the data is said to be homogeneous when the significance value (Sig.) is more than 0.05. The homogeneity test results can be seen in Tables 3 and 4.

The homogeneity test of cognitive learning produced a significance value equal to 0.801 (>0.05). Thus, the cognitive class data is considered homogeneous.

The homogeneity test for improvisational learning generated a significance value of 0.781 (>0.05). Thus, the data for the improvisational class is considered homogeneous.

Table 3. Homogeneity test for cognitive learning.

Levene statistic	df1	df2	Sig.
.064	1	108	.801

Table 4. Homogeneity test for improvisational learning.

Levene statistic	df1	df2	Sig.
.077	1	118	.781

3.2 Method

This research used a quantitative approach with quasi-experimental methods. The selection of quasi-experimental research was made in order to reveal a comparison of learning methods. What is compared are the cognitive learning model and the improvisational learning model.

This research was conducted by using two groups. One group of 55 students received the cognitive learning model and the second group of 60 students received a learning model of improvisation. Before being subjected to the two learning models, both groups were subjected to pretesting. After both groups were exposed to the learning materials, the post-test was administered in order to establish and compare the results of learning method treatments given to the two groups. Figure 1 shows the research design.

As a quasi-experimental research, the researcher determined the two classes as the object of research. The experimental class was given the improvisational learning model and the control class was given the cognitive model.

The assessment of these two learning models was made possible by the pretest + treatment + post-test design. The assessment aimed to find a significant difference between the students' learning outcomes prior to the application of each learning model via pretesting, and with a post-test after the treatment of cognitive learning models (experimental classes) and improvisational learning models (control classes). The learning results in both classes were then processed with statistical techniques with the help of SPSS 16 for Windows, to generate the difference in gain (gain).

The gain is based on the acquisition of the average pretest value and the mean value of the post-test for the two classes, and then calculated so that the results obtained for research can be used to answer the research hypothesis proposed in this study.

3.3 Testing the research hypothesis

After administering the hypothesis prerequisite test, that are normality and homogeneity tests, hypothesis testing is performed. From the results of the analysis that has been done, the data that was tested was shown to have normal and homogeneous distributions. Therefore, the researchers proceeded with parametric statistics. The hypothesis test used in this research was a *t*-test using SPSS 16 for Windows. The *t*-test states that if the value of significance is below 0.05 then an independent variable has an effect on a dependent variable. Whereas, if the value of significance is above 0.05 then an independent variable has no effect on a dependent variable. The *t*-tests used are a paired sample *t*-test and independent sample *t*-test.

The purpose of this hypothesis testing is to compare which of the two models is a better learning model for musical arts learning outcomes: the cognitive learning model or the improvisational learning model. The data used in this hypothesis testing is the gain values of the cognitive learning model and the improvisational learning model. The test that was carried out paired sample tests of each group: the group using the cognitive learning model and the group using the improvisational learning model. The hypothesis testing was performed, providing a collection of data before and after the learning model treatments in different time with the independent sample *t*-test administered to know the mean values of two different

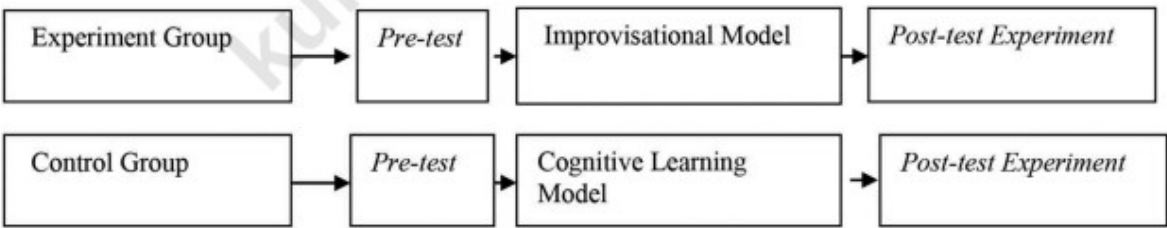


Figure 1. Non-randomised control group pretest/post-test design.

groups. Decision criteria in paired sample tests are not accepted if the value of significance is smaller than the real level used (0.05) or Sig. $< \alpha$.

4 RESULTS & DISCUSSION

4.1 Results

This study aimed to compare the cognitive learning model with the improvisational learning model for efficacy on learning outcomes in musical arts. From the results of descriptive analysis, the average pretest value on the cognitive learning model was 48.53, while the post-test value on the cognitive learning model was 63.22. For the improvisational model, the average pretest value was 50.60 while the average post-test value was 67.47. Each model showed an increase in value from the pretest to post-test averages. The cognitive learning model obtained an increase of 14.69 while the improvisational learning model showed an increase of 16.87.

The results of the paired sample *t*-test analysis with SPSS 16 for Windows statistical software showed the cognitive learning model had a significance value of 0.001 while the improvisational learning model also had a significance value of 0.001.

To find the difference in the improvement of learning outcomes between the cognitive learning model and the improvisational learning model an independent sample *t*-test was used. From the results, the significance value is 0.03. Hypothesis testing was also conducted to find out which model is better. From the results obtained, the mean value of cognitive learning model was 0.2813 while the improvisational learning model obtained a mean of 0.3382.

4.2 Statement of results

The results of data calculations can be seen in Tables 5, 6, 7, 8 and 9.

Table 5. Calculation results for both learning models.

Group	Cognitive		Improvisational	
	Pretest	Post-test	Pretest	Post-test
Average	48.53	63.22	50.60	67.47
Max	67	80	67	83
Min	30	47	30	50
SD	8.56	8.35	8.49	8.21
Var	73.25	69.69	72.13	67.48

Table 6. Paired sample *t*-test for the cognitive learning model.

		Sig. (2-tailed)
Pair 1	Pretest_cognitive Post-test cognitive	.000

Table 7. Paired sample *t*-test for the improvisational learning model.

		Sig. (2-tailed)
Pair 1	Pretest_improvisation Post-test_improvisation	.000

Table 8. Independent test sample *t*-test.

		Sig. (2-tailed)
Gain	Equal variances assumed	.030
	Equal variances not assumed	.030

Table 9. Model comparison.

	Model	N	Mean
Gain	Cognitive	55	.2813
	Improvisational	60	.3382

4.3 Explanation

Table 5 shows the calculation results for both models. The average pretest and post-test averages of both models are obtained. The average value obtained from pretest and post-test for both models improved. Likewise, the minimum value and the maximum value obtained between the pretest and post-test values increased. The provision of learning method treatment after the pretests in this study show improved learning outcomes.

The decision criteria in the paired sample test is rejected if the significance value is smaller than the real level used (0.05) or Sig. $< \alpha$. The data shows that the significance value is 0.001. The decision criteria in the paired sample test is not acceptable if the value of significance is smaller than 0.05. The paired test sample *t*-test on the cognitive learning model is shown in Table 6. The data shows a significance of 0.001 (< 0.005), so it is concluded that there is a difference between the pretest value and post-test values for the cognitive learning model. Table 7 shows the same value of 0.001 with a significance of 0.001 (< 0.005), so it is concluded that there is a difference between the pretest and post-test values in the cognitive learning model.

In Table 8, the decision criteria on the independent sample tests is rejected if the value of significance is smaller than the real level used (0.05) or Sig. $< \alpha$. The data shows the significance value is 0.03, meaning that there is a difference in the increase of learning outcomes by using the cognitive model and the improvisational model. To see which model is better, the mean values of Table 9 are used. The data shows that learning outcomes were higher in the improvisational method than the cognitive method. Therefore, the researchers concluded that the improvisational model is better to be used than the cognitive model in improving the learning outcomes for music education.

4.4 Discussion

The results of this study are in accordance with the expectations of researchers, that teaching with the improvisational learning model is better for improving learning

outcomes compared with the cognitive learning model. The materials for the cognitive learning model were delivered by emphasising the understanding of theory, by giving the materials and then the students were given the freedom to process information, imagine, estimate and solve problems posed in the material being studied. The improvisational learning method was delivered by teaching the practice material in advance to stimulate students to know the meaning of the theory to be applied. Having the practice material in advance made it possible for students to know the theory material via practice. Thus, the improvisational learning model is better because concepts and theories were obtained directly through practice.

5 CONCLUSION

This study presented a comparison of the cognitive learning model and improvisational learning model. The researchers conclude that: 1) the improvisational learning model is better used to improve learning outcomes in music education; 2) although the improvisational learning model is better, this does not mean that the cognitive learning model is not as useful. the cognitive approach needs to be further developed to get maximum results; 3) this learning model may be less useful if applied to subjects other than music; 4) this model of learning can be an alternative approach for teachers in delivering learning materials; 5) it is expected that similar research will be carried out in the future to improve the learning outcomes of music education.

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