

# THE IMPLEMENTATION OF SCIENTIFIC APPROACH-BASED PROJECT LEARNING METHOD TO STIMULATE THE EARLY CHILD'S AUTONOMY

Andriasih Rahayu, N.K.G.<sup>1</sup>, Tirtayani, L.A.<sup>2</sup>

<sup>1,2,3</sup>Jurusan Pendidikan Dasar FIP Universitas Pendidikan Ganesha, Singaraja, Indonesia

## ARTICLE INFO

### Article history:

Received April 10<sup>th</sup> 2019  
Received in revised form  
April 15<sup>th</sup> 2019  
Accepted April 20<sup>th</sup> 2019  
Available online September  
4<sup>th</sup> 2019

### Keywords:

Project learning method,  
scientific approach, child's  
autonomy, early childhood  
education

## ABSTRACT

The study aimed to find out the effect of the implementation of scientific approach - based project learning method to stimulate the early child's autonomy skills. This study was conducted by quasi-experiment research with nonequivalent control group design. The population of the research is the whole group B TK Gugus IV Cempaka Denpasar Barat which is involving 529 children. The sample is taken randomly by using a random sampling technique. B1 group TK Sila Dharma amount to 24 children as the experimental group and B1 group TK Kumara Tunggal amount to 26 children as the control group. The data is taken by non-test techniques is observation. Data were analyzed using the t-test. Based on the result of the analysis, the average score of the experimental group (88,88) is higher than the average score of the control group (82,00). The result of the analysis using t-test with  $dk = 24 + 26 - 2 = 48$  and  $\alpha = 5\%$  obtained  $t\text{-count} > t\text{-table}$  is  $3,018 > 2,021$  it means  $H_0$  rejected and  $H_a$  accepted. It means that there was a significant difference in early child autonomy between classes that were taught by the project learning method based on the scientific approach and classes that were taught by the conventional learning model. Thus, the project learning method based on the scientific approach influences to early child autonomy of group B TK Gugus IV Cempaka Denpasar Barat Academic Years 2018/2019.

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## 1. Introduction

Early age is a phase to optimize all aspects of childhood development. The phase is also called the golden age where children grow and develop rapidly for the next periods. It is very important for parents and teachers to provide good stimuli for aspects of child development such as education, socialization, and skills in carrying out daily activities. The abilities obtained from these experiences can be beneficial for the future of the child.

One aspect that should be developed is social emotional, especially life skills autonomy. Autonomy is reached through the experience process conducted by a person in their development phase, wherein the process of becoming independent, children learn to deal with various situations in their social environment. Therefore, children are able to think and take appropriate actions in overcoming the situation. Children who are dependent are usually vulnerable to anxiety, fear when alone, tend to await parents when doing school activity and anxiety to do something without others support. Consequently, teachers and parents must work together to develop children's autonomy aspect of life skills since it is very important for the needs of children's daily lives.

Desmita (2017:184) argue that autonomy will be formed if there is individual readiness, both physical and emotional, to independence with others. Wiyani (2013:28) states that autonomy is a character that can make children stand-alone, not dependent on other people, especially for their parents. The two definitions are in line with what Holec's argument. Holec (in Little, 1999:14) has stated that autonomy as the ability to understand of learning and is responsible for all decisions such as in determining goals, defining or interpreting things, and choosing the method or technique to be used, and evaluate the activities that have been carried out. So accordingly, to these arguments that autonomy is the

ability to think and to have the initiative to decide to do something and accept the consequences so that they can complete their tasks and not depend on others. Learning about life skills can train children's skills to be independent.

Early child's autonomy can be identified from some of the characteristics namely they have faith in their self, high intrinsic motivation, capable and courageous determine choice, creative, innovative, responsible for accepting the consequences, and adapted to the circumstances, as well as not dependent on others (Susanto, 2017:39). From these characteristics, it is clear that skills are very important to be optimally stimulated. In its development efforts, it is also necessary to pay attentions factors that can inhibit the achievement of the objectives, such as regulations in the environment. Regulations such as restrictions given by parents or teachers make children dependent on doing things (Green, 2013:12). Children need a situation that allows them to do tasks and express their desires and creativity. Therefore, teachers need to use child-centered learning methods and involve active children in the learning process. Martakis, et.al, (2018) states that autonomy also can be trained in children who have special situations.

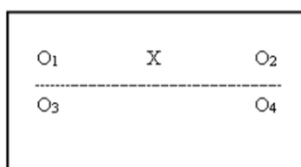
The project learning method, in the learning process, is a method that provides learning experience by procuring small projects or research activities. The method stems from John Dewey's notion of "learning by doing" which is prioritizing the process of mastering children how to do a job consisting of a series of behaviors to achieve goals and outcomes. Musfiqon & Nurdyansyah (2015:133) suggests that the project learning method uses a project or activity as a medium. Children conduct exploration, assessment, interpretation, and collect information to produce various forms of learning outcomes. In implementing methods, students become motivated to more active. Teachers act as facilitators who provide materials in this activity. The teacher refers to the material-oriented to children needs and interests. In this process, teachers also train the students to develop abilities, skills, and creativity in carrying out these activities. The use of project learning methods can give a lesson to children to finding solving problems in their daily lives (Fathurrohman, 2015:126).

In Indonesia, the project learning method is carried out based on a scientific approach where it is implemented based on the 2013 curriculum. The Indonesian Ministry of Education and Culture has decided that the material learning criteria of the scientific approach are based on facts or phenomenon, logics, explainable, and reasonable. The teacher's explanation, the child's response, and educative interaction between teacher and child based on the flow of logical thinking. The scientific approach support and stimulate children to think critically in identifying, understanding, and solving problems in the learning process. It will contribute to developing the ways of children thinking rationally and objective. In other words, it can say the learning objectives of the scientific approach are formulated in simple and clear ways, but interesting on the packaging.

Based on observations of students on group B which is conducted in January 2019 at the kindergarten (*Taman Kanak-kanak or TK*) of Gugus IV Cempaka Denpasar Barat, several causes of the low autonomy of children were identified. In the learning process, not all children are actively involved. Children are not sure of their abilities and ask to direct the teacher continuously. Children also need support from others above their learning activities so that some children are not able to complete their tasks on time. This shows that the autonomy of children has not developed optimally. Therefore, it needs efforts to train children autonomy so that there have life skills that can be useful in daily life. Children should be involved and active in the learning process so that children's autonomy can develop optimally. Teachers need to use child-centered learning methods and can attract children's attention to increase children's autonomy according to their needs and development. Based on these arguments, this research is examined the implementation of scientific approach-based project learning method to stimulate the early child's autonomy. The method is a method of giving experience on how to solve problems by involving a project that uses scientific steps to produce new work and knowledge.

## 2. Methods

The research was conducted at group B of TK Gugus IV Cempaka Denpasar Barat in the 2018/2019 Academic Year. The study uses experimental research methods. It is a quasi-experimental using a nonequivalent control group design as a research method.



**Figure 1.**  
The design of Nonequivalent Control Group Design (Sugiyono, 2017:116)

The population of research was all children in group B TK Gugus IV Cempaka. The research sample is part of the population. The research was using random sampling techniques. 24 children from group B1 TK Sila Dharma has been chosen as the experimental group and 26 children of group B1 TK Kumara Tunggal as the control group.

The position of experimental and control groups must be equal. The equality of the subject as the characteristics of research is important because it is related to the final results of the experiment. An interview is conducted to the headmaster of TK Gugus IV Cempaka, it is to ensure there is no superior class. Sample group has been chosen by raffle technique, it is to decide which group will be present as an experimental and control group. The subject maturity must also be controlled to obtain the validity of the research. To control the subject is to choose subjects who are expected to have similar experiences of maturity and development between the experimental group and the control group. Through maturity aspect, it can be seen that the age range of the experimental and the control group is 5-6 years.

The threat of external validity needs to be considered in this research. We manage this threat by focusing interaction of settings with treatment. External validity also looks at the relationship between research settings by inviting children to feel comfortable and happy in following the learning process. Another way was doing to control external validity is by limiting the population. The blueprint of the instrument used to measure the autonomy skill of children in group B TK Gugus IV Cempaka Denpasar Barat Academic Year 2018/2019 are described in table 1.

**Table 1.**  
Blueprint of The Autonomy Skills (children aged 5-6 years old)

Variable	Aspect	Indicator
Early child's autonomy	Emotional Autonomy	- initiative in doing things - confidence
	Behavior Autonomy	- able to make a choice - to be responsible
	Value Autonomy	- knowing the wrong and right deeds - creative and innovative in doing assignments

The data collection on this study was using an observation technique. The data is analyzed with inferential statistics. Inferential statistics are used to test hypotheses through the t-test which begin with a prerequisite analysis, namely the normality test and homogeneity test.

### 3. Findings and Discussion

The description of the child's independence data is obtained by the average pre-test of the experimental group is 47.08 and the average on the post-test is 88.88. In the control group, the average pre-test is 45,31 and the posttest average is 79,92. Based on this result, it is indicated that the independence of the experimental group children that were taught by the scientific approach-based project learning method had a higher average than the control group that was not taught by the method. The description of data can be seen in Table 2.

**Table 2.**  
Description of Research Result Data

Analysis Result	Experimental Group	Control Group
Pre-test Average	47,08	45,31
Post-test Average	88,88	79,92

Before conducting a hypothesis test, a prerequisite test is carried out first which includes a normality test and a variance homogeneity test. The normality test of data distribution is to present that the sample comes from a population that is normally distributed. The normality test of the distribution of children's independence scores using Chi-quadratic analysis is presented in the table 3 as follows.

**Table 3.**  
Data Normality Test

Sample	$X^2_{\text{count}}$	$X^2_{\text{table}}$	Conclusion
Experimental group	2,50	11,07	Normal distribution
Control group	3,99	11,07	Normal distribution

The normality test of the independence data experimental group children obtained result  $X^2_{\text{count}} < X^2_{\text{table}}$  (2,50 < 11,07) so that it can be concluded that the data is normally distributed. The normality test of the independence data control group children obtained result  $X^2_{\text{count}} < X^2_{\text{table}}$  (3,99 < 11,07) so that it can be concluded that the data is normally distributed.

The homogeneity of the variance tested by Fisher (F) test, which is presented in table 4 as follows.

**Table 4.**  
Data Homogeneity Test

Sample	$F_{\text{count}}$	$F_{\text{table}}$	Conclusion
Experimental Group	1,04	1,96	Homogenous
Control Group			

The homogeneity test of the experimental group and the control group tested at the significance level of 5% (dk numerator = 23 and the denominator = 25). The results of F count are less then value of F table (1,04 < 1,96 ). That result means that variant of the data is homogenous. Based on these results, the t-test with the pooled variance formula as the statistical test used in this study.

**Table 5.**  
The Hypothesis Test

Sample	N	Dk	Mean	$T_{\text{count}}$	$t_{\text{table}}$	Conclusion
Experimental group	24	4	88,88	3,98	2,021	$H_0$ is rejected
Control group	26	8	79,92			

Based on the result, obtained  $t_{\text{count}} = 3,98$  while at the significance level  $\alpha = 5\%$  with dk = 48,  $t_{\text{table}} = 2.021$ . The result is  $t_{\text{count}} > t_{\text{table}}$  (3,98 > 2,021) so that it can be concluded that  $H_a$  "there are significant differences early child's autonomy that were taught by the scientific approach-based project learning method and classes that were taught by conventional learning model in group B TK Gugus IV Cempaka Denpasar Barat in academic year 2018/2019 " is accepted.

The scientific approach-based project learning method influences early child's autonomy in making choices and being responsible and having initiatives in doing things. In the process, the child starts asking based on objects that are seen and heard. It is shows that children respond is seen by asking activity. When the teacher answers the questions from their students, it will be associated with the material being taught. Then the children resolve the problem by collaborating in a group discussion with other children. In this case, it must be equitable and not in favor of one group.

Scientific problem-solving methods can help children understand, determine and analyze solutions of the problem. As stated by Umar (2017:10) and Rusman (2017:423) in the core activities of learning with a scientific approach, students are expected to be able to carry out 5 stages of activities namely observing, asking questions, gathering information, reasoning and communicating. According to Alfred De Vito, the scientific approach is learning that uses scientific steps in building knowledge through the scientific method (Saefuddin & Berdiati, 2016:43). The scientific approach does not only look at the learning outcomes but also skills in the learning process. Putri, Anggita et.al, (2018) argues by having a scientific attitude will encourage students to look for an answer, critical thinking so that they can answer the curiosity of students. In the learning process, children's skills emphasize in production of knowledge, discover and develop their facts and concepts as well as the values needed.

In a scientific approach, children's autonomy abilities are honed in such a way throughout the learning process. However, the arrangement of space and learning facilities also need to be considered, so that children can use the prepared space to increase their independence in learning both with the media and their social environment. Green (2013) argue that teacher should also consider the balance between

structured and unstructured environments. By designing spaces which allow children to claim their own place, create their own rules, exercise creativity and imagination, and allow for the development of environmental competency, adults can better support children in fostering their place identity and a positive relationship with the natural world. Vuorisalo, et.al (2018), argues that the increasing self-management of children in kindergarten is seen as one aspect of autonomy. Aspects of this freedom and self-organization can be seen as new ways of controlling and governing children. Control has become more indirect and implicit, and participation is based more on the child's individual ability to manage in different situations than was previously the case when education was more teacher-oriented.

In Côté-Lecaldare, et.al (2016), teacher can support children's autonomy with three categories. First, the adult allows the child to determine his or her activities (e.g., pursuing his or her desired game or selecting the day care task he or she wants to do). The child is even free to decide if he or she wishes to take part in activities planned by the child care educator. Child care educators may invite the child to join the activity but ultimately respect his or her decision. Second, the adult allows the toddler to lead his or her activities, such as letting the child decide on the materials and direction of a craft project, how to eat his or her lunch (e.g., with hands or utensils), or whether he or she wants the adult to take part in his or her play or not. Third, the adult welcomes and supports the toddler's discoveries. These stages become material in the learning steps using the project method for early childhood. Research found that autonomy was possible to encourage children to abide by behavioral rules (cleaning brushes during a painting activity) without thwarting their interest and motivation for the task, as long as the rules were presented to the children in an autonomy-supportive manner. By implement those steps, early education teachers also had a positive experienced in stimulating the autonomy skill of children in their classroom. The students can get involved in the classroom activities.

The using of scientific approach-based project learning method, children are directly involved in carrying out an activity. The method is more meaningful for children, because they built the knowledge by their own experience. Putri, et.al, (2018) argue that the project method is a method that can arouse the activeness of children by solving problems given by the teacher. So that children can work together with groups and have confidence in socializing with friends. Children learn to understand something deeper and they can remember the experiences they involved. In the learning process before the teacher assigns the child to make a project, the teacher explains first and invites the child to observe the facts. The teacher also invites children to ask questions about the theme of the project so that the child gets information and understands the project to be made. Bowlby (in Heylen et al., 2019) argued that children's repeated experiences with teacher support during proximity-seeking and exploration in trust about teacher availability and support or the belief that teacher will be available if needed. Trust fosters exploration because children who have trust in teacher support believe that when exploration leads to elevated levels of distress as a consequence of getting hurt, scared or sad, their teacher will be there for them to provide proximity and support.

The study was identified factors that increase children's independence during the fieldwork. When doing the activity, children are enthusiast, it happened because children were given the freedom to choose the preferences of activity. Some children seem to be able to complete the project, although there is still the task is incompletely and do not finish on time. When the teacher invites their students to ask questions, some children seem to share their experiences. In group assignments, the child looks capable of choosing the task to be performed. Children seem to have more understanding in doing their tasks. Children can work well together in their groups so they can complete their tasks on time. At the recalling, the child also actively answers the teacher's questions. This means that in recalling allows the child to build a strong memory of his experience in making the project.

#### 4. Conclusion

This research concluded that the scientific approach-based project learning method influences the early child's autonomy. The autonomy skill of children in the experimental group obtained with an average score is 88.88. The highest score on the experimental group is 98 and the lowest is 71. Whereas it was different in the control group, the autonomy skills obtained an average of 79.92, with the highest score is 90 and the lowest score is 67. The result shows that the average score of autonomy skill in the experimental group is higher than the average score on the control group. Statistical analysis using the t-test (with  $df = 48$  and  $\alpha = 5\%$ ), shows the  $t_{count} > t_{table}$  ( $3.98 > 2.021$ ), so there is a significant difference of early child's autonomy between the kindergarten who were taught by scientific approach-based project learning method and who were taught by conventional learning method. By considering the result, it is important to implement the scientific approach-based project learning method in kindergarten

classrooms. The implementation of that method allows the early years' students to include in their classroom activities. Teachers must be able to create a delight learning process with project learning methods and various scenarios of learning activities. Teachers also can use media creatively as a project main to attract children's attention.

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