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Impact of Patte-Patte-Based Flying Light Assembly Training onThe Skill Level of Elementary School Students in Grade 3 International School Klang Kuala Lumpur Malaysia

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Abstract

Community Service Activities of the Research and Community Service Institute of Makassar State University (LP2M-UNM) in collaboration with the International School Klang (SIKL) Kuala Lumpur Malaysia, based on the results of observations on Elementary School Students in Grade 3, the service team found that the level of students' skills in assembling flying lights was still very lacking or not yet sufficiently skilled so that it was necessary to conduct PKM training in assembling flying light games based on patte-patte. This service aims to determine the effect of training in assembling flying light games based on patte-patte on the skill level of elementary school students in grade 3 of the International School Klang (SIKL) Kuala Lumpur Malaysia. The sample used in this service was 15 students. The data collection technique used was observation. The data analysis technique used t-test using SPSS 20 program. Research hypothesis: there is an effect of flying light game assembly training on the skill level of elementary school students in grade 3 in assembling flying lights based on patte-patte at the International School of Klang (SIKL) Kuala Lumpur Malaysia. The results of the data analysis concluded that there was a significant difference between the skill levels of elementary school students in grade 3 after the learning process of flying light game assembly training based on patte-patte. This means that Ho is rejected and Ha is accepted in other words there is a significant difference between before and after training in assembling flying light games based on patte-patte. The effect of flying light games based on patte-patte on the skill level of elementary school students in grade 3 of the International School of Klang (SIKL) Kuala Lumpur Malaysia is in the very well developed (BSB) category.

Keywords: Vocational, science skills, flying light games, patte-patte,

Introduction

Education represents the influence that adults have on those who are not yet mature; in this case, it is the education provided by teachers to students to support their development. The developmental characteristics of first, second, and third-grade elementary students generally include physical growth that has reached maturity, allowing them to control their bodies and balance. Elementary education is essentially organized to facilitate the comprehensive growth and development of students, emphasizing the holistic development of all aspects of the student's personality. Therefore, it is crucial to give students the opportunity to develop their personality and potential to the fullest. Consequently, schools need to provide various activities to foster different aspects of development, such as cognitive, language, social, emotional, physical, science, and motor skills. One essential skill to develop in elementary school students is vocational ability or practical skills.

Students' lives are inseparable from skills, science, creativity, and social activities, such as eating, drinking, and using various household objects. Therefore, teachers should stimulate students through various activities related to skills and technology. Introducing skills and technology to elementary students should focus more on the process rather than the product. For elementary students, process skills should be implemented in a simple, playful manner. Science activities allow students to explore various objects, both living and non-living, in their surroundings. Through this, students learn to observe physical phenomena and events associated with these objects.

Elementary school students (ages 6-12) are in what is called middle childhood, considered a mature period for learning. At this stage, students have a strong desire to master new skills taught by teachers in school. One indicator of this school-age period is that students' attitudes toward their families become less egocentric, shifting toward a more objective and empirical view of the outside world. It can be concluded that there is an intellectual attitude at this stage, marking it as an intellectual period. This aligns with the view that school age is often referred to as the intellectual stage or the age of school adjustment (Lara Fridani, 2009, p. 26). During this stage, students are generally easier to educate than in prior or subsequent stages.

To enhance skills and scientific understanding in students, strategies must be implemented to develop these competencies. One such strategy is through play. According to human development expert Papalia (in Thobroni & Fairuzul, 2011), children's world revolves around play. Play is also a primary learning approach in elementary school. This is consistent with the learning principle of "learning through play" or "learning while playing." Play is an enjoyable activity carried out for the activity's own sake. This study's research questions are as follows: a) What is the skill level of third-grade students at the International School Klang (SIKL), Kuala Lumpur, Malaysia, before assembling the flying lamp game based on *patte-patte*? b) What is the skill level of third-grade students at SIKL after training to assemble the flying lamp game based on *patte-patte*? c) Is there an impact after the training to assemble the flying lamp game based on *patte-patte* on the skill level of third-grade students at SIKL?

According to these questions, the study's objectives are a) to determine the skill level of third-grade students at SIKL before assembling the *patte-patte*-based flying lamp game; b) to determine the skill level of third-grade students at SIKL after training to assemble the *patte-patte*-based flying lamp game; c) to determine the effect of training to assemble the *patte-patte*-based flying lamp game on the skill level of third-grade students at SIKL.

Neuman (Yulianti, 2010) defines skill level as both product and process. As a product, science is a well-organized body of knowledge about the physical world. As a process, science—which includes investigating, observing, and experimenting—is essential for students to participate in scientific processes, as the skills they acquire can be applied to other areas and benefit them throughout life. According to Peter Rillero (Yulianti, 2010), students become interested in science when given the opportunity to experiment. The *patte-patte*-based flying lamp game is a simple assembly skill that uses natural materials such as fiber, mica, wire, LED lights, rubber, and wood. Once connected to a battery, the LED light shines brightly; if launched with force, the light can soar high, creating a beautiful sight as it descends from the sky.

Observations conducted by researchers indicate challenges in students' abilities to assemble the *patte-patte*-based flying lamp, including: 1) most students did not exhibit active engagement; for instance, when asked to assemble components and launch the flying lamp, students remained silent and showed little initiative; 2) students struggled to connect components when instructed to attach the light to the battery using enamel wire, as only a few students, albeit shyly, attempted the task; and 3) students did not yet understand cause and effect, such as what makes the lamp light up. When tasked with replicating the flying lamp and launching it using *patte-patte* and rubber launchers, only a few students were able to make the lamp fly and light up by connecting both ends of the enamel wire.

Methods

This research falls under experimental research. According to Sugiyono (2007), experimental research can be defined as a research method used to investigate the effect of a specific treatment on another variable in controlled conditions. The design of this study is Pre-Experimental Designs in the form of a One Group Pretest-Posttest. Pre-Experimental Designs are considered preliminary experiments because external variables may still influence the formation of the independent variable. The One Group Pretest-Posttest design includes a pretest conducted before the treatment is administered. The model of this design can be seen in the following diagram:

One Group Pretest-Posttest Design

Y1	X	Y2

Explanation:

Y1 = Pre-test before being given treatment

X = A patte-patte based flying lights game treatment

Y2 = Post-test after being given treatment

The subjects of this study are third-grade students at Sekolah International Klang (SIKL) in Kuala Lumpur, Malaysia. There are a total of 15 students, consisting of 5 girls and 10 boys. Before analyzing the data, prerequisite tests were conducted, namely normality and homogeneity tests. Once these prerequisites were met, the data was analyzed. The t-test was used in this study. This technique aligns with the experimental method suggested by Sugiyono (2010), and the formula is as follows:

$$t = \frac{Md}{\sqrt{\frac{\sum(Xd)^2}{N(N-1)}}}$$

Explanation:

- Md = Mean of the deviation (d) between the posttest and pretest
- Xd = Difference of each deviation from the mean deviation (d - Md)
- Df or db = Degrees of freedom, calculated as N - 1
- N = Number of research subjects

Results

The schedule for the implementation of the community service activities can be seen in the table below.

Table 1 Treatment Schedule

Day/date	Activity	Place
Monday, August 5, 2024	Observation	School
Tuesday, August 6 2024	Pretest	School
Hours: 08.00-08.45	Treatment 1	School
Hours: 09.00-09.45	Treatment 2	School
Hours: 10.00-10.45	Treatment 3	School
Hours: 11.00-11.45	Treatment 4	School
Hours: 12.00-12.45	Posttest	School

The criteria for decision-making in hypothesis testing are based on the probability value of the t statistic (Sig.t) obtained at a significance level (α) = 0.05. If the p-value ≤ 0.05,

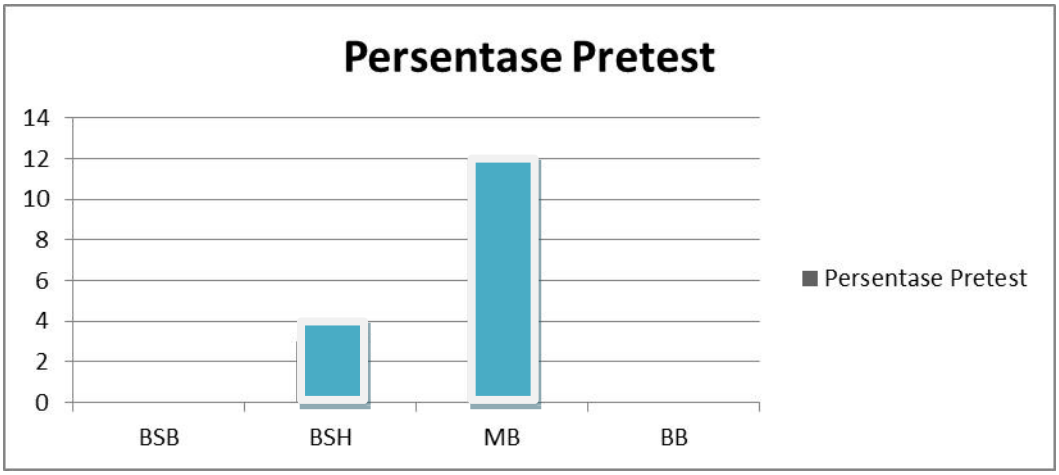
it indicates a significant effect. If the resulting coefficient is positive, it indicates a positive and significant effect.

Table 2. General Overview of Third Grade Students' Skill Levels in Assembling Flying Lamps at Sekolah International Klang (SIKL), Kuala Lumpur, Malaysia Before Treatment (Pretest)

No	Category	Score Range	F	%
1.	BSB	76-100%	0	0%
2.	BSH	51-75%	3	20%
3.	MB	26-50%	12	80%
4.	BB	< 25%	0	0 %
Total			15	100 %

Explanation:

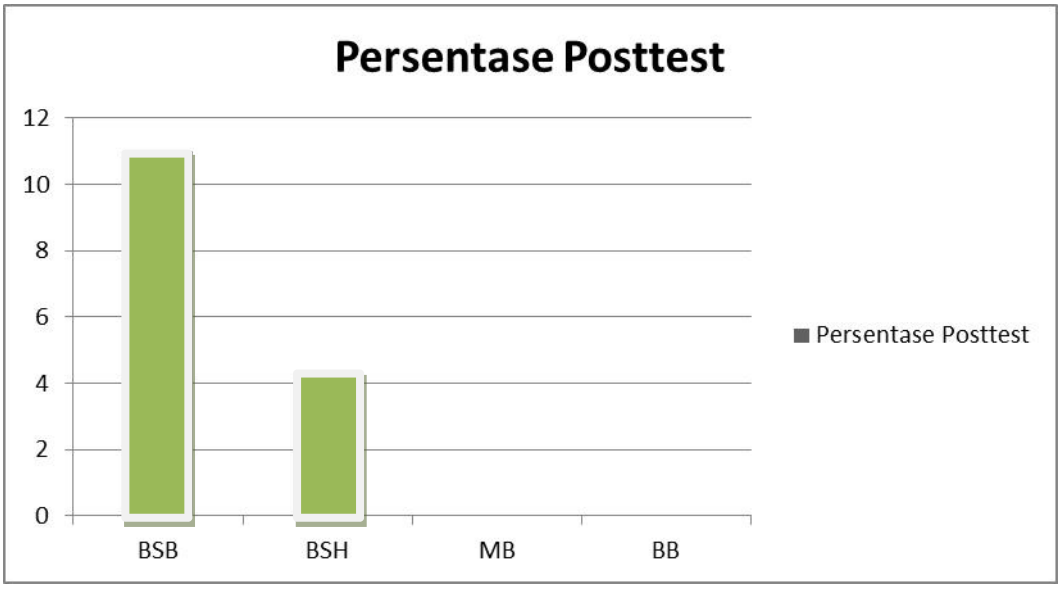
- BB = Not Developed
- MB = Beginning to Develop
- BSH = Developing as Expected
- BSB = Developing Very Well



Based on the table above, it can be observed that the skill level of students before the training on assembling the flying lamp game based on patte-patte shows that there are 0 students in the BSB category with 0%, 3 students in the BSH category with 20%, 12 students in the MB category with 80%, and 0 students in the BB category with 0%.

Table 3. General Overview of the Ability to Assemble Flying Lamps of Third-Grade Students at Sekolah International Klang (SIKL), Kuala Lumpur, Malaysia After Treatment (Posttest)

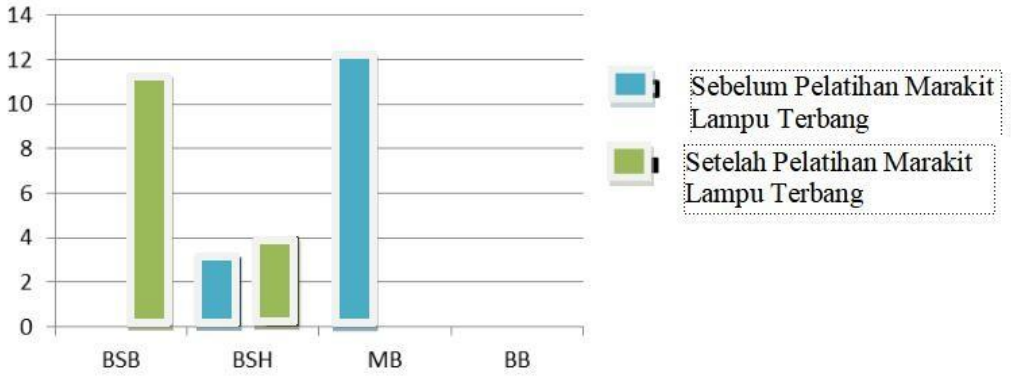
No	Category	Score Range	F	%
1.	BSB	76-100%	11	73,3%
2.	BSH	51-75%	4	26,7%
3.	MB	26-50%	0	0 %
4.	BB	< 25%	0	0 %
Total			15	100 %



Based on the table above, it can be observed that the skill level of students after the treatment (posttest) shows that 11 students are in the BSB category with 73.3%, 4 students are in the BSH category with 26.7%, 1 student is in the MB category with 0%, and 0 students are in the BB category with 0%. The results of the Pretest and Posttest in this study can be seen in the recap and graph below:

Table 4. Recap of Students' Skill Levels Before and After Receiving Training on Assembling the Flying Lamp Game Based on Patte-Patte

No	Cetegory	Score Range	Before		After	
			F	%	F	%
1.	BSB	76-100 %	0	0 %	11	73,3%
2.	BSH	51-75 %	3	20%	4	26,7%
3.	MB	26-50 %	12	80%	0	0%
4.	BB	<25 %	0	0%	0	0 %



Based on Table 4, the comparison before and after the training shows that the majority of students who received the training on assembling the flying lamp game based on Patte-Patte experienced an improvement in skills. Initially, no students were in the BSB category (0%), 3 students were in the BSH category (20%), and 12 students were in the MB category (80%). After the training, there was an improvement, with 11 students in the BSB category (73.3%), 4 students in the BSH category (26.7%), and no students in the MB or BB categories (0%).

Linearity Test

The linearity test in this study was conducted using SPSS Windows Ver. 20. To learn more, please refer to the table below:

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
VAR00001 * VAR00002	Between Groups	(Combined)	9,433	4	2,358	4,288	,028
		Linearity	8,904	1	8,904	16,190	,002
		Deviation from Linearity	,529	3	,176	,321	,810
	Within Groups		5,500	10	,550		
	Total		14,933	14			

Based on the table above, the results of the linearity test for the students' skill level in assembling and flying the patte-patte-based flying lamp show a value of 0.028. This means that the Sig Combined value is smaller than 0.05 (0.028 < 0.05). Therefore, it can be concluded that the relationship between the pretest and posttest skills in assembling the patte-patte flying lamp is linear.

Homogeneity Test

The homogeneity analysis in this study uses the chi-square test with the help of SPSS Windows version 20. If the value in the Sig column is greater than 0.05, then the null hypothesis (Ho) is accepted. If the Sig value is less than 0.05, then the alternative hypothesis (Ha) is rejected.

Test Statistics

	Before	After
Chi-Square	3,400[a]	3,333[b]
Df	3	4
Asymp. Sig.	,334	,504

Based on the table above, the Asymptotic Significance (Asimp Sig) values before the treatment is 0.334 and after the treatment is 0.504, both of which are greater than 0.05. Therefore, the null hypothesis (Ho) is accepted. It can be concluded that both groups are homogeneous or have the same variance.

Normality Test

The rule used is that if the sig value < 0.05, the data is not normally distributed. Conversely, if the sig value > 0.05, the data is normally distributed (Jonathan Sarwono, 2012). The results of the normality test can be seen in the following table:

One-Sample Kolmogorov-Smirnov Test

		Before	After
N		15	15
Normal Parameters	Mean	8,07	13,20
	Std. Deviation	1,033	1,146
Most Extreme Differences	Absolute	,259	,169
	Positive	,259	,169
	Negative	-,151	-,164
Kolmogorov-Smirnov Z		1,003	,655
Asymp. Sig. (2-tailed)		,273	,813

It is known that the data is normally distributed, as seen from the sig value before treatment, which is 0.273, and the sig value after treatment, which is 0.813. These values indicate that the sig value is greater than 0.05, so Ho is rejected, and Ha is accepted.

Hypothesis Test

Data is considered to have experienced a significant improvement if the sig value < 0.05. If sig > 0.05, then Ho is accepted, Ha is rejected, and conversely, if sig < 0.05, then Ho is rejected, and Ha is accepted.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00001 - VAR00002	-5,133	,743	,192	-5,545		-26,760	14	,000

To determine whether the hypothesis is accepted or rejected based on the SPSS 20 data, it can be seen from the comparison between the calculated t_{value} and the t_{table} value. The result of the t_{test} shows that the calculated t_{value} of 26.760 is greater than the t_{table} value of 2.145 with degrees of freedom (df) as follows:

$$Df = (n-1)$$

$$= 15-1 = 14$$

With df = 14, it can be seen that the calculated t-value of 26.760 is greater than the t-table value of 2.145, so Ho is rejected and Ha is accepted. This means that there is an effect of the Patte-Patte flying lamp game assembly training on the skill level of third-grade students at Sekolah International Klang (SIKL) Kuala Lumpur, Malaysia, both before and after the training.

Before the training, the skill level of the students in assembling the flying lamp game was evaluated, and it was found that some students had not yet mastered the skill. Based on the descriptive analysis of the skill level of third-grade students at Sekolah International Klang (SIKL) Kuala Lumpur, Malaysia, the pretest results showed a total score of 121 with an average of 8.06%. When looking at the individual criteria, there were no students in the BSB category (0%), 3 students in the BSH category (20%), 12 students in the MB category (80%), and no students in the BB category (0%). This indicates that the skill level of the students at the time of the pretest was still low. During the learning process, students were still not skilled at assembling the components of the flying lamp according to their correct positions.

The data above show that the skill indicator of sequential assembly was the most mastered by the students compared to other indicators. The highest final score was on the indicator "students skillfully observe the phenomena occurring during the Patte-Patte flying lamp game," with a total score of 34. This indicator received the highest score because nearly all students were skilled at observing the phenomena occurring during the flying lamp game. The lowest score was on the indicator "students skillfully group objects according to their categories," with a total score of 23. This indicator received the lowest score because students were not yet skilled at assembling the components of the flying lamp in the correct order. The low skill level of the students was caused by the limited playtime during the lessons, which made it difficult for students to keep up with the learning process and prevented them from participating seriously.

Based on the pretest results, there was a need to improve the students' skills through treatment with the flying lamp game assembly training. After the treatment, with the assembly training, students showed enthusiasm while playing and flying the lamps. Students joyfully watched the Patte-Patte flying lamp game and eagerly completed their lamp assemblies. Some students even repeated the flying of their assembled lamps because they found it enjoyable. After students played with the flying lamps, an evaluation of their skill level was conducted. Following the posttest, the total score was 198 with an average of 13.2. There was an improvement in the average skill level of students from 8.067 in the pretest to 13.2 in the posttest after the flying lamp game assembly training.

The posttest results showed a total score of 198 with an average of 13.2%. The highest final score was on the indicator "skill in assembling components," with a final score of 52, representing 86.67%, falling into the BSB category. This aligns with Vygotsky's view (Montolalu et al., 2009), stating that play is a way for students to think and solve problems. The highest score was also on the indicator "skill in flying the Patte-Patte lamp," with a final score of 52, representing 86.67%, which also falls into the BSB category. This is consistent with Piaget's theory (1970), which suggests that students understand knowledge and skills through interaction with the objects in their environment. Another high score was on the indicator "students skillfully install and arrange the components of the flying lamp," with a final score of 52, representing 86.67%, in the BSB category.

The next indicator, "students skillfully group components according to their categories," received a final score of 42, representing 70%, placing it in the BSH category. This indicator, which received the lowest score before treatment, also showed improvement. This is consistent with Peter Rillero's findings (Yulianti, 2010) that students become skilled at assembly when they are given opportunities to experiment. The process of assembling the flying lamp, including exploring, observing, and assembling, is very important as it encourages students to engage in the scientific process. The skills they acquire can contribute to other developments and will be beneficial throughout their lives.

Based on the data analysis and percentages, the pretest results for third-grade students at Sekolah International Klang (SIKL) Kuala Lumpur, Malaysia, showed a total score of 121 with an average of 8.06%. In terms of individual categories before treatment, no students were in the BSB category (0%), 3 students were in the BSH category (20%), 12 students were in the MB category (80%), and no students were in the BB category (0%).

After the treatment, the posttest showed a total score of 198 with an average of 13.2%. In the posttest, 11 students were in the BSB category (73.3%), 4 students were in

the BSH category (26.7%), with no students in the MB (0%) or BB (0%) categories. The improvement in skill level aligns with Peter Rillero's view (Yulianti, 2010) that students become skilled when they are given opportunities to experiment.

The posttest results confirmed that students' skills in assembling and flying the Patte-Patte lamps improved. This finding is also supported by previous research, such as the study by Sumiyah (2014), which indicated that the lamp game improves students' skills after training. Based on calculations, the Patte-Patte flying lamp game had an influence of 82.50% on students' skill levels.

This assembly training was conducted to determine if there was a significant effect before and after the flying lamp assembly training on the skill levels of third-grade students at Sekolah International Klang (SIKL) Kuala Lumpur, Malaysia. The significance test showed $t = 26.761$ with $Sig = 0.000$, which indicates a significant effect, as $Sig < 0.05$. This suggests that one effective way to improve students' skill levels is through the Patte-Patte flying lamp game, which ultimately enhances students' skills. The research findings indicate that the effective contribution of the flying lamp assembly training to the students' skill levels is 64.71%, while 35.29% is influenced by other factors.

According to Sudono (2000), play can also improve assembly skills and provide more opportunities for students to explore, making it easier for them to understand concepts and basic knowledge. This study shows that the Patte-Patte flying lamp game improves students' skills after training. Based on calculations, the game has an influence of 64.71% on students' skill levels. This means that there is a significant effect of the Patte-Patte flying lamp game on students' vocational skills or skill levels.

Therefore, there was a significant change in students' skill levels before and after using the Patte-Patte flying lamp game, with a larger change occurring after the treatment. This confirms that the Patte-Patte flying lamp game has a significant influence on students' vocational skills or skill levels. Based on this, it can be concluded that the flying lamp assembly training is effective in improving the skill levels of third-grade students at Sekolah International Klang (SIKL) Kuala Lumpur, Malaysia.

Conclusion

There is a significant effect of the training on assembling the Patte-Patte flying light game on the skill level of 3rd-grade elementary students at Sekolah International Klang (SIKL) Kuala Lumpur, Malaysia, before and after the experiment was conducted, with the treatment being the Patte-Patte flying light game.

Recommendations

Based on the conclusions, the researcher provides the following recommendations:

1. For the school: The school is responsible for designing strategies that include engaging and memorable games for students. One such game is the Patte-Patte flying light game used in this study, or other similar games that can be incorporated into the curriculum.
2. For teachers: The Patte-Patte flying light game can be further utilized in activities according to the students' needs to help motivate them in learning. Teachers should be more creative in determining teaching strategies, creating a fun learning atmosphere, and making better use of various media in teaching.
3. For future researchers: This research can serve as a reference for conducting further studies, particularly for those interested in addressing student skill development issues.

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