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Research Article

The Effectiveness of Flipped Project-Based Learning (F-Pjbl) Model to Improve Entrepreneurial Skills of Hearing-Impaired Students

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ABSTRACT

Hearing impairments cause hearing impairment studentss to experience communication disorders. Most hearing impairment students after graduating are unable to continue to higher education or vocational training, and thus work for wages below the minimum wage. This study aims to determine the effectiveness of using the Flipped Project Based Learning (F-PjBL) learning model to improve the entrepreneurial skills of hearing impairment students. The subjects of the study were hearing impairment students at Pangudi Luhur Special School B SMALB. The sampling technique used purposive sampling with a total of 10 people at the SMALB level. Data were obtained from the results of the pretest and posttest. The research instrument is a pretest posttest consisting of 5 questions about entrepreneurial skills. The research design used is one group pretest posttest. Data analysis using paired t-test with SPSS 24 comparing the average of two data and derived from one sample group. The results showed that there was a significant difference between the pretest and posttest scores of students with a significance value of 0.001 <0.05. The pre-test score obtained an average learning outcome of 40.66, while the post-test score obtained an average learning outcome of 70.00. This shows that there is a significant influence on the differences in treatment given to each variable. So that the Flipped Project based Learning (F-PjBL) learning model is effective in improving the entrepreneurial skills of hearing impairment students.

Keywords: Flipped Project Based Learning, learning model, entrepreneurial skills, hearing-impaired students.

INTRODUCTION

Every aspect of life in the 21st century will be influenced by technology, information, and the internet (Sari, Y.I., Sumarmi, S., Utomo, D.H., & Astina, I.K. 2021). The G20 Summit in 2022 emphasizes equality and economic welfare for people with disabilities. The direction of President Joko Widodo on the International Disability Day is on how to implement Law Number 8 of 2016 concerning Persons with Disabilities, along with the various derivatives that have been made. One of the emphases is facilitating the improvement of abilities of people with disabilities by providing access for them to become entrepreneurs. People with disabilities need to build Micro, Small, and Medium Enterprises (UMKM). Therefore, training to improve their knowledge related to business, finance, digital, and soft skills, needs to be developed.

Hearing impaired students are children who have lost all or part of their hearing so that they are unable or less able to communicate verbally and even though they have been given assistance with hearing aids, they still require special services (Chamidah, 2010: 34). Hearing impairment results in developmental delays in speech and language acquisition, leading to learning difficulties and poor academic performance (Capalit & Carlos, 2021: 105). Misnawati et al., (2022) argue that hearing impairment students are generally capable of developing knowledge and mastering their skills. Therefore, special education for hearing impairment students should not only focus on academic skills, but also self-development, including the development of vocational skills.

Vocational skills are activities designed and provided to students to provide them with post-graduation provisions (Farooq, Ajmal, & Nafees, 2011). Vocational skills learning is important to be given to hearing impairment students, because vocational skills have the purpose of providing provisions in terms of independence, responsibility, certain skills, and providing students with provisions to enter the community or the world of work. Vocational skills learning for students with special needs, including hearing impairment students, can also stimulate sensitivity, professionalism, creativity and leadership (Hidayat & Saputi, 2018). Hearing impairment students need to be given vocational skills learning, because these skills can provide independence, readiness, and provisions for students to enter the community or the world of work after graduating from school (Andini, A., Wardany, O. F., & Herlina, H., 2024).

The largest age group experiencing deafness is adults who are classified as productive age, namely around 15-29 years old. Most of them after graduating cannot continue to higher education or vocational training, finally working with wages below the minimum (Salazar-Clemeña, 2006: 49). Hearing impairment students who are under the supervision of their parents even though they are old enough, do not get fair treatment in the family (Capalit & Carlos, 2021:107). This causes many deaf people to be unemployed, stay at home and do simple household chores. One of the factors that hinders the economic growth of the deaf in Indonesia is the lack of access to livelihoods and entrepreneurial skills training at the high school/vocational school/special high school/special high school level (Capalit & Carlos, 2021:108).

The results of observations conducted by involving 20 hearing-impaired students at the SMALBsin Jakarta, namely the SLB Pangudi Luhur, SLB Santi Ram, SLBN 1 Jakarta and SLBN 2 Jakarta carried out on the 23rd of May 2023 showed that the low practical entrepreneurial skills of hearing-impaired students were at 80%. They were confused to start their business when given the opportunity to practice entrepreneurship. Their theoretical entrepreneurial skills were low, at 84%, and their material understanding in entrepreneurship learning was at 60%, which made it quite difficult for them to understand abstract material. The main obstacle was the lack of vocabulary skills in words related to entrepreneurship material. These facts indicate the need for an appropriate learning model, especially in the subjects of entrepreneurship for hearing-impaired students.

There are many learning models that can be used in the learning of hearing impairment students. Some effective learning models to improve vocational skills include demonstration methods, direct instruction methods, drill methods, practice methods, practice rehearsal pair methods, project-based learning methods, self-regulated learning methods, mastery learning and modeling. The nine methods have in common that there is direct practice of the skills to be taught. So for teachers who will teach vocational skills, they are expected to provide vocational learning that contains direct practice activities (Andini, A., Wardany, O. F., & Herlina, H., 2024).

Entrepreneurial skills learning that accommodates theoretical (online) and practical (offline) understanding in the community needs to be developed and learned by hearing- impaired students. Flipped learning is a form of learning that allows hearing-impaired students to get online theoretical learning and offline practical learning through entrepreneurial learning practices in everyday life (Al-Ibrahim, 2019: 325). Furthermore, alternative learning to improve critical thinking skills and real experiences in learning skills have not been fully carried out by SLB teachers. One alternative learning that the teachers can use to equip their students with skills is through the Project-Based Learning (PjBL) (Eldiva & Azizah, 2019: 348). This method actively involves students and is adjusted to the characteristics of the students.

The combination of the two learning models will be very interesting for hearing- impaired students. Flipped Learning is used to explain concepts, while PjBL functions as a tool to develop students' entrepreneurship skills (Pinto & Reshma, 2021: 593). The use of flipped and PjBL-based learning models is useful to motivate and stimulate learning interest of the hearing-impaired students (Adigun, 2020: 23). Using PjBL as the basis, the learning aspects will not only be in theory but can be practiced by teachers giving the projects to the hearing- impaired students, to develop their entrepreneurship.

OBJECTIVES

This study aims to determine the effectiveness of using the Flipped Project-Based Learning (F-PjBL) learning model to improve the entrepreneurial skills of hearing-impaired students.

MATERIALS AND METHODS

This study uses a quantitative approach. The research design used one group pretest posttest by comparing the values before the test and after the test. The study aims to determine the effectiveness of the F-PjBL model in improving the entrepreneurial skills of hearing impaired students.

The population in this study were hearing-impaired students at SLB B Pangudi Luhur Jakarta. The subjects of the study were 10 hearing-impaired students at the SMALB level. Subjects were selected using a purposive sampling technique.

Data collection in this study used a pre-test and post-test instrument consisting of 5 questions. This instrument was used to determine the level of understanding of the entrepreneurial skills of the hearing-impaired students before and after using the F-PjBL module.

Data collection was carried out in March 2024, at school, during the entrepreneurship learning of fan-making material, in 3 meetings. In the first meeting, the hearing-impaired students were given pre-test questions to determine their level of understanding of entrepreneurial skills and to practice the stages of the skills that they knew. In the second meeting, students practiced the stages of fan-making skills. And in the last meeting, students practiced the stages of fan-making skills and were given post-test questions.

The data analysis technique to gauge the level of understanding was carried out using a paired t-test with SPSS 24. The data analysis results were then evaluated and reflected to determine the effectiveness of the model.

RESULTS

The comparative results from the use of the flipped project-based learning model to improve students' entrepreneurial skills, can be seen in the following table:

Table 1: The frequency of effectivity test

Subject	Pre	Post
Ns	20	30
Psp	20	50
Frd	20	90
Alf	20	90
Gnd	40	70
Nn	10	70
Jn	30	50
Hln	20	70
Zv	70	80
Ksh	20	70

Normality Test

The prerequisite calculation for the paired t-test is normally distributed data. The normality test is to test whether the distribution of the dependent variables for each value of a particular independent variable is normally distributed or not. This data normality test uses the Kolmogorov-Smirnov Test of Normality.

One-Sample Kolmogorov-Smirnov Test

			Unstandardized Residual
N			15
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		14.31584988
Most Extreme Differences	Absolute		.183
	Positive		.183
	Negative		-.178
Test Statistic			.183
Asymp. Sig. (2-tailed)[c]			.188
Monte Carlo Sig. (2-tailed)[d]	Sig.		.183
	99% Confidence Interval	Lower Bound	.173
		Upper Bound	.193

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.

Figure 1. Results of the normality test distribution

From the SPSS output results of the Kolmogorov-Smirnov test, it is gathered that the Normal Distribution or Z count values has a value of 0.183, with a significance of Asymp.Sig (2-tailed) of 0.188, so that it is greater than 0.05. Thus, it can be concluded that the data is normally distributed.

Homogeneity Test

The homogeneity test is used to determine the similarity of data variance. The homogeneity test in this study was carried out with SPSS using the Levene Statistic test. The results of the homogeneity test are as follows:

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Hasil Belajar	Based on Mean	4.767	1	28	.038
	Based on Median	4.654	1	28	.040
	Based on Median and with adjusted df	4.654	1	24.211	.041
	Based on trimmed mean	4.474	1	28	.043

Figure 2. Results of the homogeneity test

From the above SPSS output results of the Levene Statistic test, it can be seen that the significance value of 0.043 is greater than 0.05, making the data variance homogeneous. Thus, it can be concluded that the homogeneity test is met.

Paired-T Test

This study uses a paired t test to determine whether the F-PjBL learning model influences the improvement of entrepreneurial skills of the hearing-impaired students towards achieving learning objectives. The pre-test and post-test data yielded the following results:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	40.6667	15	18.69556	4.82717
	Posttest	70.0000	15	14.63850	3.77964

Figure 3. The test results of paired samples statistic

The average learning outcome for the Pre-test value or "Mean" is 40.66, while the average learning outcome for the Post-test value is 70.00. The number of respondents or students used as research samples is 15 persons. The standard deviation value for the Pre-test is 18.695 and the Post-test is 14.638. Lastly, the Std. error Mean value for the Pre-

Test is 4.827 and the Post-Test is 3.779. Because the average value of learning outcomes in the Pre-Test is 40.66 < Post-Test 70.00, it means that descriptively speaking, there is a difference in the average learning outcomes between the Pre-Test and Post-Test results.

Paired Samples Correlations

		N	Correlation	Significance One-Sided p	Significance Two-Sided p
Pair 1	Pretest & Posttest	15	.209	.228	.455

Figure 4. Paired samples correlations

The results of the correlation test or relationship between the two data or between the variables of Pre-Test and the Post-Test. Based on the above output, the correlation coefficient value is 0.209, with a significance value (Sig.) of 0.228. This states that the correlation between the pre-test and post-test is significantly related, because the probability value is < 0.05.

Paired Samples Test

		Paired Differences					t	df	Significance One-Sided p	Significance Two-Sided p
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper				
Pair 1	Pretest - Posttest	-29.33333	21.20198	5.47433	-41.07460	-17.59207	-5.358	14	<,001	<,001

Figure 5. Paired T-Test Results

From the results of the paired samples test, a significance value of < 0.05 is obtained, meaning that there is a difference between the pre-test and post-test values. This shows that there is a significant influence on the treatment differences given to each variable.

DISCUSSION

The results of the effectiveness test of the Flipped Project-based Learning (F- PjBL) learning model showed a significant difference between the pre-test and post- test scores from students with a significance value of 0.001 < 0.05. This means that the Flipped Project-based Learning (F-PjBL) learning model is effective to improve entrepreneurial skills of hearing-impaired students.

Improving the entrepreneurial skills of hearing-impaired students has a positive impact on learning. This is in line with research conducted by Al-Ibrahim (2019: 336), which states that flipped learning for hearing-impaired students shows the effectiveness of the strategy yields a positive impact on understanding learning materials and improving skills, such as collaboration and interaction. Another study conducted by Pinto & Reshma (2021: 593) states that the combination of Flipped Learning is used to explain concepts, while PjBL functions as a tool to develop students' entrepreneurial skills.

All stages of entrepreneurship learning have a positive impact on improving the skills of hearing-impaired students. They consisted of product manufacturing, packaging, and marketing skills. Skill improvements in the first cycle, namely in a) product manufacturing, only a few students were able to understand what indicators are present in product manufacturing, b) in product packaging, only a few students knew how to package products, and in product marketing, only a few students knew how to market products through e-commerce.

Improvements in the second cycle included: a) product manufacturing, students determined the product to be made, namely fans made from batik jumputan, b) students modified existing product packaging, and in c) product marketing, students created a Shopee e-commerce account. Improvements in the third cycle included: a) product manufacturing, wherein students were able to create craft from batik jumputan cloth, namely the folding fans, b) in

product packaging, students were able to provide various product packaging, and in c) product marketing, students were able to create captions for products to be uploaded to their Shopee accounts.

Supporting factors for the success of improvements in each cycle were due to the consistency of the F-PjBL learning model syntax in entrepreneurship module that develops entrepreneurial skills. The syntax of the F-PjBL learning model emphasizes direct student involvement in learning. This is in accordance with the opinion of Suherman, et al. (2020:2) that the project-based learning model directly involves students in the learning process, when working on and completing a project. In addition, the use of F-PjBL was proven to be a very good combination. One of the advantages is the increase in student responsibility in their own learning process (Beres & Kis, 2018:561).

CONCLUSIONS

The results of the effectiveness test concludes that there is indeed an increase of entrepreneurial skills of the hearing-impaired students by means of the F-PjBL learning model. The difference results of the tests showed significant effective increase before and after the implementation of the F-PjBL learning model. Therefore, the Flipped Project Based Learning (F-PjBL) learning model is effective in improving the entrepreneurial skills of deaf students.

The existence of this research is expected to be used as a reference for several parties, including: (a) For SMALB entrepreneurship teachers, especially the deaf, it is recommended to use the F-PjBL learning model. To better understand this model, teachers can study the results of this study to implement the F-PjBL learning model. (b) School principals are expected to increase collaboration with entrepreneurial or industrial stakeholders who open up opportunities for people with disabilities. And (3) for other researchers, it is hoped that they can develop the F-PjBL learning model by expanding the scope of other entrepreneurial skills fields.

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