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PiEOK: Technological Innovation to Create Prophetic Leaders through Physics Learning

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ABSTRACT: This research aims to determine the effect of implementing the PiEOK application in physics learning on student's prophetic attitudes. The research method used was quasi experimental with a post-test only control design. The population of this research was students from SMA Negeri 14 Bekasi and SMA Negeri 17 Bekasi and the sample used was 143 people. Data collection was through questionnaires using the technique of distributing questionnaires to the research sample. The results of the research show that there is a significant influence of the implementation of the PiEOK application in physics learning on student's prophetic behavior. This is reinforced by the Sig score being 0.000 < 0.05 with a $t_{calculated}$ value of 7.858 so that H_1 is accepted. Thus, the PiEOK application in physics learning can be used as another alternative as a new strategy for the physics teaching process.

KEYWORDS: Implementation, PiEOK Application, Physics, Learning, Prophetic

INTRODUCTION

Prophetic leadership is leadership with strong morality and character as well as being exemplary in all aspects (Izzet et al., 2020). Prophetic leadership is a leader's activity that influences other individuals to achieve organizational goals effectively by upholding the principles and values of the Prophet (Rahman & Hamdi, 2021). The Prophet's exemplary characteristics include Shidiq which means honest, Amanah which means trustworthy, Tabligh which means to convey, and Fathanah which means intelligent (Al-Amini, Fauzi, & Zohriyah, 2024). A person's prophetic leadership arises from various factors, namely internal factors in the form of emotional and spiritual conditions and external factors in the form of interactions with family and the surrounding environment (Safitri, Faizah, & Lestari, 2022).

Shidiq's character means honest. The existence of an honest nature in a person will have an influence on the surrounding environment, such as a sense of helping each other or working together with each other, thus creating a peaceful living environment. Shidiq's character is a reference in determining whether an individual's actions are good or not as well as the main milestones in all matters of goodness (Setyowati, 2019). The implementation of the assessment of Shidiq's characteristics includes being honest, tough (hard to be influenced), brave, consistent, and having a firm stance on positive things (Rahayu, 2021). Trustworthiness means being trustworthy. Individuals who have a trustworthy nature will try not to lie in their words and uphold truth and justice in their actions (Sari & Ermawati, 2022). The presence of this characteristic in a person can prevent him from slander because everything he does must be accounted for. Implementation of character that is in accordance with the nature of Amanah, namely an attitude of responsibility and discipline. In this attitude, an individual must carry out his duties and obligations well, participate and be active in various activities, provide truthful explanations, be on time, and obey rules or orders.

The nature of Tabligh means conveying. The nature of Tabligh can teach individuals to behave boldly in conveying something that is in accordance with Islamic teachings. This is what makes Tabligh's nature as controlling the order of life around it. In this case, there are several ways that an individual can do to build the Tabligh character, including relating various events through positive activities, advising others with polite and courteous behavior, being open to any criticism and input from other individuals, and implementing the good qualities of prophets and apostles. in everyday life. Fathanah's character means intelligent. This intelligence is used to analyze a formulation or plan accurately and precisely. Therefore, intelligent individuals will avoid fraudulent and dishonorable actions. The implementation of a person's intelligence in Fathanah's character is clearly visible from the way he treats other people, the process of managing time, and the pattern of managing the ownership of special and valuable substances.

Character is the basis for applying prophetic leadership to the formation of leadership in a person. This is because character is related to all parts of a person's life and their behavior (Ermawati et al., 2019). Attitude assessment is aimed at determining the

level of student character development. However, prophetic leadership is an attitude that is very vulnerable to being ignored by students. Therefore, student's prophetic leadership can be used as a benchmark for assessing attitudes in physics learning.

Physics learning is defined as a process of interaction between educators and students related to nature and its manifestations, such as mastering concepts, laws, theories, principles and their application in everyday life (Aprilia, Miftahul, Nuraini, & Sedayu, 2022). Learning physics is a mandatory subject that must be mastered by students in the science specialization group (Tisa Haspen & Syafriani, 2022). Physics learning also plays an important role in the educational process and global technological development (Sari, Dwikoranto, & Lestari, 2021). Physics lessons have many abstract concepts, so teachers need to use appropriate teaching and learning strategy and relevant learning media for their effectiveness (N. & F., 2024).

One effective strategy that can be used in learning physics is the application of learning media. The use of media can support the learning process and help students understand physics concepts (Sidik, Marsela, & Rusdiana, 2022). Learning media has a positive influence in building a class atmosphere, such as the use of android based applications as an alternative for presenting today's teaching materials, namely the PiEOK application. The PiEOK application was created using Thunkable. Thunkable is software designed not to require a specific program code structure, making it easier for novice users in the process of creating applications with the Android operating system (Anam & Anggraini, 2020). Thunkable is an application developer for various types of smartphone operating systems, such as Android and iOS (Raharjo, 2019). Thunkable can also be interpreted as free application creation software with program blocks, namely drop and drug.

Based on this description, researchers conducted research with the title "Implementation of the PiEOk Application in Physics Learning for Prophetic Students". This research aims to determine the application of the PiEOK application in physics learning as an alternative teaching process strategy so as to create an interesting atmosphere and improve student learning outcomes, especially regarding attitude assessment.

METHOD

This research uses a quasi experimental method with a mixed method approach. The research design used was a post-test only control design. The population of this study were students from SMA Negeri 14 Bekasi and SMA Negeri 17 Bekasi. The research sample used was 143 people. Research data was obtained using a questionnaire distribution technique with an instrument in the form of a questionnaire filled in by the research sample. The assessment indicators from the student prophetic questionnaire can be seen in Table 1 below:

Table 1. Student Prophetic Questionnaire Assessment Indicators

No.	Prophetic Dimension	Indikator Penilaian
1.	**Shidiq (Honest)**	Don't copy answers on tests.
		Don't copy other people's work.
		Dare to provide accurate information.
		Dare to admit mistakes.
		Dare to give good arguments.
2.	**Amanah (trustworthy)**	Doing the job well.
		Be willing to accept the consequnces.
		Take an active role in group activities.
		On time.
		Doin something that is ordered.

The scoring technique for the questionnaire instrument was created using a Likert Scale. The questionnaire scoring rubric and interpretation of student's prophetic values are shown in Table 2 and Table 3 below:

Table 2. Student Prophetic Questionnaire Scoring Rubric

Answer Choices	Scor
Always	4
Often	3
Seldom	2
Never	1

Table 3. Interpretation of Student's Prophetic Values

Value Range	Predicate	Information
80 – 100	A	Very Good
66 – 79	B	Good
56 – 65	C	Pretty Good
40 – 55	D	Not Good
0 – 39	E	Very Not Good

The student's prophetic instruments used are calibrated through validity and reliability testing. Test the validity of the student's prophetic questionnaire using the product moment correlation coefficient (r) calculation as follows:

$$r_{XY} = \frac{n(\sum XY) - (\sum X)(\sum Y)}{\sqrt{\{n\sum X^2 - (\sum X)^2\}\{n\sum Y^2 - (\sum Y)^2\}}}$$

Information:

r_{XY} = Correlation coefficient between variable X and variable Y
n = The number of respondents
ΣX = The total score of each item
ΣY = The total score of the items
ΣX^2 = The sum of the squares of the scores for each item
ΣY^2 = The sum of the squares of the overall item scores
ΣXY = The number of times variable X is multiplied by variable Y

The testing rules used are as follows:
If the score is $r_{calculated} > r_{table}$, then the statement item is declared valid.
If the score is $r_{calculated} < r_{table}$, then the statement item is declared invalid.

The reliability test for student's prophetic questionnaire instruments uses Cronbach's Alpha calculations as follows:

$$r_i = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum {\sigma_b}^2}{{\sigma_t}^2}\right)$$

Keterangan:

k = Many items
$\sum {\sigma_b}^2$ = Number of item variants
${\sigma_t}^2$ = Total variant

The student's prophetic questionnaire is said to be reliable if the score value $r_i > 0{,}7$. Furthermore, the data analysis technique in research is through the Two Mean Difference Test using the t-test as a statistical test.

1. Requirements Test

a. Normality Test

The normality test in this study used the SPSS version 22 program via the Liliefors test with the following hypothesis testing criteria:

H_0 is accepted if the Sig score > 0,05 so that the data is normally distributed.
H_0 is rejected or H_1 is accepted if the Sig score < 0,05 so the data is not normally distributed.

b. Homogeneity Test

The homogeneity test in this study used the SPSS version 22 program via the Levene test with the following hypothesis testing criteria:

H_0 is accepted if the Sig score > 0,05 so that the data has a homogeneous variance.
H_0 is rejected or H_1 is accepted if the Sig score < 0,05 so the data has a non homogeneous variance.

2. Hypothesis Test

Hypothesis testing in this research uses the SPSS version 22 program through the Two Mean Difference test with the following hypothesis testing criteria:

H_0 is accepted if the Sig score > 0,05 so that there is no significant influence of the implementation of the PiEOK application on student's prophetic.
H_0 is rejected or H_1 is accepted if the Sig score < 0,05 so that there is a significant influence of the implementation of the PiEOK application on student's prophetic.

RESULTS AND DISCUSSION

The validity and reliability tests of the questionnaire were carried out on 36 respondents with a score of r_{table} = 0,325. Based on the results of validity test calculations using the SPSS version 22 program on the student's prophetic questionnaire, it was found that 8 questions were declared valid and 2 questions were declared invalid. The results of the validity test of the student prophetic questionnaire are as follows:

Table 4. Questionnaire Validity Test Results

Statement Items	$r_{calculated}$	r_{table}	Information
1	0,243	0,325	Invalid
2	0,371	0,325	Valid
3	0,442	0,325	Valid
4	0,187	0,325	Invalid
5	0,584	0,325	Valid
6	0,687	0,325	Valid
7	0,383	0,325	Valid
8	0,610	0,325	Valid
9	0,689	0,325	Valid
10	0,685	0,325	Valid

Next, the valid questionnaire was tested for reliability with the following results:

Table 5. Questionnaire Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
.653	8

Based on Table 5, it is known that the student prophetic questionnaire is said to be reliable in the moderate category because the r_i score < 0,7. Then, the research data obtained was analyzed descriptively as follows:

Table 6. Frequency Distribution Table Student Prophetic Questionnaire

Statistics			
		YA1	YA2
N	Valid	72	71
	Missing	71	72
Mean		73.60	81.62
Median		74.00	81.00
Mode		78	84
Std. Deviation		6.671	5.470
Minimum		56	65
Maximum		91	91

Based on Table 6, the results show that the average value in the control class is 73,60 with the middle value (median) being 74. Furthermore, this data has the value with the highest frequency (mode), namely 78 and the standard deviation value (standard deviation) amounting to 6,671. Then, the highest value in the data is 91 and the lowest value is 56. Meanwhile, in the experimental class the average value is 81,62 with the middle value (median) being 81. Furthermore, this data has the value with the highest frequency (mode), namely 84 and a standard deviation value of 5,470. Then, the highest value in the data is 91 and the lowest

value is 65. The results of the descriptive statistical calculations that have been carried out are interpreted in the form of a histogram as in Figure 1 and Figure 2 below:

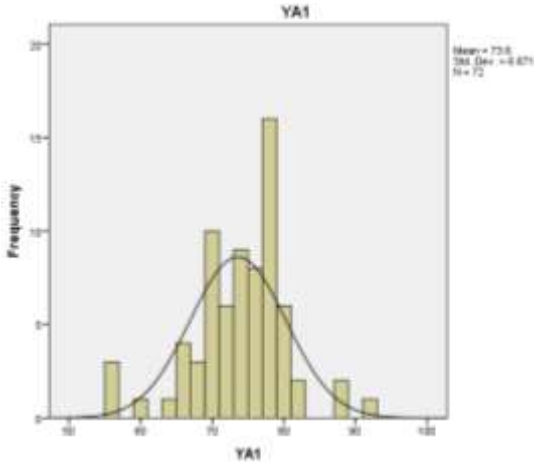

Figure 1. Prophetic Histogram of Students Taught without the PiEOK Application

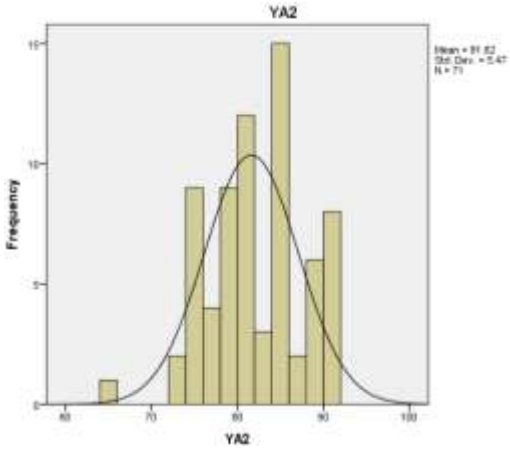

Figure 2. Prophetic Histogram of Students Taught via the PiEOK Application

Then, the results of the data normality test from the research carried out are as follows:

Table 7. Data Normality Test Results

One-Sample Kolmogorov-Smirnov Test			
		YA1	**YA2**
N		72	71
Normal Parameters[a,b]	Mean	73.60	81.62
	Std. Deviation	6.671	5.470
Most Extreme Differences	Absolute	.102	.105
	Positive	.102	.098
	Negative	-.100	-.105
Test Statistic		.102	.105
Asymp. Sig. (2-tailed)		.062[c]	.051[c]
a. Test distribution is Normal.			
b. Calculated from data.			
c. Lilliefors Significance Correction.			

Based on Table 7, the control class group data (YA1) is normally distributed because the Sig score 0,062 > 0,05 with a Statistical Test score of 0,102 so H_0 is accepted. Not only that, the data from the experimental class group (YA2) is normally distributed because the Sig score 0,051 > 0,05 with a Statistical Test score of 0,105 so H_0 is accepted. Next, the research data was tested for homogeneity with the following results:

Table 8. Data Homogeneity Test Results

Levene's Test of Equality of Error Variances[a]			
Dependent Variable: Prophetic			
F	**df1**	**df2**	**Sig.**
.602	1	141	.439
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + A			

Based on the results of the homogeneity test on the PiEOK Application media variable, the student group data in the control class (A1) and experimental class (A2) had homogeneous variance because the Sig score 0,439 > 0,05 with an $F_{calculated}$ score of 0,602 so that H_0 was accepted. Then, the results of hypothesis testing from the research conducted are shown in Table 9 below:

Table 9. Hypothesis Test Results (t-test)

Independent Samples Test										
		Levene's Test for Equality of Variances		**t-test for Equality of Means**						
									95% Confidence Interval of the Difference	
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Lower**	**Upper**
Prophetic	Equal variances assumed	.602	.439	7.858	141	.000	8.022	1.021	10.041	6.004
	Equal variances not assumed			7.869	136.480	.000	8.022	1.020	10.039	6.006

Based on Table 9, the results show that there is a significant influence of the implementation of the PiEOK application in physics learning on student's prophetic behavior. This is because the Sig score 0,000 < 0,05 with a $t_{calculated}$ score of 7,858 so H_1 is accepted. Thus, the overall test results according to the research data obtained can be said that the implementation of the PiEOK application has a significant influence on physics learning so that it can be used as another alternative as the newest strategy for the physics teaching process.

CONCLUSIONS

Based on the results of the research data analysis "Implementation of the PiEOK Application in Physics Learning on Student's Prophetics" it can be concluded that there is an influence of the implementation of the PiEOK application in physics learning on student's prophetics. This is indicated by the Sig score 0,000 < 0,05 and the $t_{calculated}$ score of 7,858 so that H_1 is accepted. These results also confirm that the application of the PiEOK application in physics learning is an alternative strategy for the teaching process so as to create an interesting atmosphere and improve student learning outcomes, especially regarding attitude assessment.

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REFERENCES

1) Al-Amini, M. F., Fauzi, A., & Zohriyah, A. (2024). Kajian Teoritis Kepemimpinan Prophetic. Irje: Indonesian Research Journal On Education, 4(2), 95-100.
2) Anam, M. K., & Anggraini, L. (2020). Meningkatkan Literasi Perbankan Syariah dengan Mengembangkan Aplikasi Edukasi Berbasis Android. JUST IT: Jurnal Sistem Informasi, Teknologi Informatika Dan Komputer, 10(2), 129–135.
3) Aprilia, D. A., Miftahul, Nuraini, L., & Sedayu, A. (2022). Efektivitas Model Pembelajaran Problem Based Learning dengan Pendekatan Scientific Berbantuan PhET Simulation terhadap Hasil Belajar Siswa. Jurnal Pendidikan Fisika Undiksha, 12(2), 176-180.
4) Ermawati, I. R., Anomeisa, A. B., & Seputra, H. (2019). Pengaruh Keterampilan Proses Sains Terintegrasi Karakter terhadap Hasil Belajar Fisika. JPF: Jurnal Pendidikan Fisika, VII(1), 106–115.

5) Izzet, A., Tobroni, Haris, A., & Mardiana, D. (2020). Prophetic Leadership Mahasiswa: Studi pada Program Pembentukan Kepribadian dan Kepemimpinan Universitas Muhammadiyah Malang. Al-Idaroh: Jurnal Studi Manajemen Pendidikan Islam, 4(2), 140–153.
6) N., F., & F., M. (2024). Systenatic review: Permasalahan Pembelajaran Fisika dan Solusinya pada Masa Pandemi Covid-19. JP2F: Jurnal Penelitian Pembelajaran Fisika, 15(2), 167-174. doi:DOI: 10.26877/jp2f.v15i2.16348
7) Raharjo, S. (2019). THUNKABLE SECRET Panduan Lengkap Membuat Aplikasi Android dalam Hitungan Menit. Novo Media.
8) Rahayu, A. I. (2021). Sifat-Sifat Rasulullah Saw sebagai Dasar Pendidikan Karakter. Prosiding Seminar Nasional Dies Natalis UTP Ke-41, 1(01), 19–26. https://doi.org/10.36728/semnasutp.v1i01.5
9) Rahman, L. Z., & Hamdi, A. (2021). Analisis Kepemimpinan Profetik dalam Manajemen berbasis Sekolah di MI Miftahul Ulum Anggana. Al-Idarah: Jurnal Kependidikan Islam, 11(1), 84-95. doi:https://doi.org/10.24042/alidarah.v11i1.8836
10) Safitri, A., Faizah, K., & Lestari, S. (2022). Nilai-Nilai Prophetic Leadership Peserta Didik pada Pembelajaran Yanbu'a (Studi Kasus Siswa Kelas IV MI Islamiyah Desa Sepanjang Kecamatan Glenmore). ATTA'LIM: Jurnal Madrasah Ibtidaiyah, 1(2), 84-93.
11) Sari, N. N., & Ermawati, I. R. (2022). Development of Teacher-Centered Learning Model with Prophetic Values. Jurnal Pendidikan MIPA, 23(4), 1790-1801.
12) Sari, P., Dwikoranto, & Lestari, N. A. (2021). Analisis Respon dan Ketertarikan Peserta Didik terhadap Pelaksanaan Pembelajaran Fisika berbasis Environmental Learning di SMA. PENDIPA: Journal of Science Education, 5(3), 337-344. doi:https://doi.org/10.33369/pendipa.5.3.337-344
13) Setyowati, E. (2019). Pendidikan Karakter FAST (Fathonah, Amanah, Shiddiq, Tabligh) dan Implementasinya di Sekolah. Deepublish.
14) Sidik, E. L., Marsela, S., & Rusdiana, D. (2022). Implementasi Media Pembelajaran Fisika berupa LKPD Berbantuan PhET Simulation pada Materi Listrik Arus Searah. Edufisika: Jurnal Pendidikan Fisika, 7(1), 123-128.
15) Tisa Haspen, C. D., & Syafriani. (2022). Praktikalitas dan Efektifitas E-Modul Fisika SMA berbasis Inkuiri Terbimbing Terintegrasi Etnosains untuk Meningkatkan Kemampuan Berpikir Kreatif Peserta Didik. Jurnal Penelitian dan Pembelajaran Fisika, 8(1), 10-16.