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⁸**Pojok digital: The role of technology to improve learning motivation and literacy of primary school students**

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Abstract. Learning is a system consisting of integrated elements that result in act changing. In a learning activity, students' learning motivation and varieties of literacy are essential to achieve required learning objectives as required by teachers and government based on the national curriculum. In this era, students' need in the learning process is affected by the development of technology. The existence of technology is intended to improve learning motivation for students and give a new variety of literacy to gain new knowledge. The purpose of this study is to seek the role of technology in learning motivation and literacy of primary school students. Through Pojok Digital located in the Elementary School of Pujiharjo 2, Kabupaten Malang, students are given access to learning material that involves technology. A quantitative approach was used in which 20 students of 5th grade as a control class and 20 students of 6th grade as an experimental class to completed a questionnaire. The subjects of this study are 20 students of 5th grade as a control class and 20 students of 6th grade as an experimental class. The result shows that the ratio of the control and experimental class through the ANOVA gain test of the output score (P) was 0.045 or less than α 0,05. The result is reinforced by paired sample t-test with sig values output (P) of 0.01 under α 0,05. The mean of motivation score in the control class gains 0.11% whereas experimental class gain significantly by 2.7%. The test result for the gain score for literacy between control class and experimental sig value output 0.006 or less than α . The result for paired sample t-test of literacy achievement experienced increases in the control class of 10.1% while the experimental class reaches 17.6%.

1. Background

The revolutionary industry 4.0 has brought some effects to life, for instance, technology and education which are affected each other. Nowadays, education in Indonesia applies technology to school management and learning system. The human groups categorized into four generations based on born year [1] they are 1) the baby boomer generation: those who were born in between 1946-1964, 2) generation x: those who were born in between 1965-1980, 3) generation y: those who are born in between 1981-1999, and 3) generation Z: those who are born in the year of 2000 and later.

This classification can be stood as a reference for the teacher to face and treat generation z students. Gen z is still evolving in computerization and internet network [2]. Learning activity that is based on digital technology will be more meaningful for those who are familiar with the technology. This learning system can lead students in the learning process and train student's ability to seek study reference online.

Based on the study field, there is still the lack of the utilization of Information Communication Technologies (ICTs) media as literacy to help students to browse the newest information and also fewer students' motivation in learning which is caused by the teacher-centred learning process. The main effect is that student is not able to explore the information they contained, deeper. Supported by the data we observed about student's learning outcomes. As many as 65% of students are incomplete in learning. According to the information obtained, the main result of the problem is that the less preference for reading and studying. Thus, it is demanded to provide media or learning resources to support student exploration to find their information.

ICTs media can be used by students as a new literacy to explore their knowledge so it is important for the teacher to understand about Technological Pedagogical Content Knowledge (TPACK) [3]. Students tend to be more responsive by applying learn-from-experimentation rather than reading static books [10]. Learning motivation is a psychic driving force for students themselves as a whole that evokes learning activities, guarantees the continuity of learning activities, and gives direction to learning activities to achieve the expected learning goal. Teacher as a facilitator is expected to provide, show, guide, and motivate students to be able to interact with any various learning sources. Learning resources are not merely just people, but those which have been designed for learning [4]. It is intended that students have the desire to achieve learning goals that have been determined by the teacher. The intended learning resource is that on technology-media based learning resources.

The ministry of education and culture has launched a national literacy movement. One of which is digital literacy. In its implementation, the digital literacy movements aim to make people have an active and creative mindset. Belshaw (2011) explains that there are eight essential elements to develop digital literacy, namely: 1) Cultural, understanding various digital user contexts, 2) cognitive, 3) constructive, 4) communicative, 5) self-confidence, 6) creative, 7) critical-thinking, and 8) responsible. In its application, these aspects are interrelated to create digital liability users who can build good communication, think critically, wisely, right on the target, and smart in processing information.

The existence of Pojok Digital is expected to be a source of learning resources following students' needs. Pojok Digital can be used by students to access or upgrade their knowledge through ICT-media based. Edutainment is the combination of categorization which focuses on visual, narration, game formats, and informal learning style [1]. Those are used to attract students' attention and inculcate that learning is fun.

Based on the background and literature review above, the problem is formulated as follow: 1) how is the role of Pojok Digital in improving student motivation in state elementary school of Pujiharjo 2, 2) how the outcomes of Pojok Digital in improving student's literacy in stat elementary school of Pujiharjo 2. From the above-formulated problems, we can seek the differentiation of motivation and the effects of new literacy before and after the actin control class and experimental class. While the interaction test of between-subject effects using SPSS 21 was done to find out the effects of Pojok Digital media on student motivation and literacy.

2. Methods

The research model was quantitative research using the quasi-experimental method to find out the effect of certain treatments on others under controlled conditions. Experimental research is an experiment that, at least, found one variable which manipulated to find the correlation between cause and effect [6]. This study used one group pretest-posttest design with inclusion technique of control and experimental class, which there were pre-test and posttest, before and after the given act. Thus, we knew the accuracy of the outcomes [7].

The subjects of this study were 20 of 5th graders as control class and 20 of 6th graders as an experimental class. This study used the prerequisite test of normality and homogeneity test to acquaint the feasibility of each group to be applied hypothesis tests. Anova gains score test was used to seek the motivation diversity and the outcomes of new literacy prior and after the test on control class and

experimental class. Whereas, the effect of interaction test between-subjects was using SPSS 21 to found the interaction value between Pojok Digital media and learning motivation on students' literacy.

3. Results and Discussion

The result shows that there are some differences in the achievement of motivation and literacy scores of students in the control group and the experimental group. Data collected are presented in Table 1 and Table 2.

Table 1. Data collected from the control group

	M1	M2	L1	L2
N	18	18	18	18
Mean	79,67	79,77	52,76	62,86
Med	80,50	82,00	52,86	64,29
Mod	83,00	82,00	44,29	64,29
Std. Dev	4,87	6,25	9,11	7,04
Var.	24,44	42,53	92,18	54,61
Min	61,00	62,00	38,57	50,00
Max	89,00	93,00	72,86	78,57

Table 2. Data collected from the experimental group

	M1	M2	L1	L2
N	20	20	20	20
Mean	86,71	89,41	52,01	69,68
Med	86,00	89,00	50,00	70,00
Mod	87,00	93,00	44,29	75,72
Std. Dev	5,36	6,37	7,71	7,02
Var.	30,45	44,25	65,85	54,26
Min	74,00	73,00	35,72	62,86
Max	100,00	100,00	70,00	81,00

Table 1 and Table 2 show the achievement scores of the control group's literacy and motivation. The result of the calculation of achievement indicates that there are differences between the initial motivation score/ pre-test (M1) compared to the final motivation/ post-test (M2) as well as initial literacy/before treatment (L1) compared to the final literacy/after treatment (L2).

This result indicates that ICTs-based learning has an impact on students' motivation and literacy. This finding is relevant to several prior studies. Technology is a powerful tool to enhance the quality of learning inside or outside of the classroom [8]. Moreover, students literacy are also improved by using computer-assisted learning because students are easier to find learning resources [9]. Students' extrinsic motivation can be converted into intrinsic motivation if classroom activity is interesting and the teacher able to supports students' feeling. In addition, students' interest is gradually developed and tends to have long-lasting effects on students' knowledge [10]. Interaction in the classroom, for example, student-teacher, student-student interaction and classroom atmosphere were also found to be important aspects for successful learning that influencing motivation.

The result of the prerequisite test-normality test and homogeneity test show that both groups met the requirements for hypothesis testing. The description of the prerequisite test result is presented in Table 3.

Table 3. The result of the prerequisite test

Score data	P on a (0,05)	
	Normality	Homogeneity
Control group	17	
M1	0,76 (normal)	0,17 (homogen)
M2	0,47 (normal)	
L1	0,56 (normal)	
L2	0,69 (normal)	0,06 (homogen)
Experimental group		
M1	0,59 (normal)	
M2	0,99 (normal)	0,38 (homogen)
L1	0,61 (normal)	
L2	0,34 (normal)	0,91 (homogen)
	Gain Score	
Motivation	0,13 (normal)	0,21 (homogen)
Literacy	0,38 (normal)	0,17 (homogen)

The result of the hypothesis test used Anova gain score test shows that there is a distinction of significant motivation improvement on the control group and experimental group which utilizes Pojok Digital. The finding is based on the score of sig output (p) counted as 0,045 or less than a (0,05). The result of the Anova gain score is presented in Table 4.

Table 4. The test result of Anova gain score motivation

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	96,34	1	96,34	4,21	0,045
Within Groups	1258,33	55	22,88		
Total	1354,67	56			

The result of paired samples t-test shows that there is a consequential improvement in learning motivation after students are introduced to Pojok Digital with sig output score counted as 0.01 or less than a 0,05. The result is showed in Table 5.

Table 5. The paired samples t-test result test in motivation

Mean	Std. Dev	95% Conf. of Diff		t	df	Sig.
		Lower	Upper			
-2,71	5,08	-4,71	-0,69	-2,76	26	0,010

The average score of students' motivation in control class increases by 0,11% while in the experimental class which used Pojok Digital as the resource of learning activity increases significantly which is 2,7%. The description of motivation score improvement shows in Figure 1.

The most significant motivational factors are reported were internal and personal ones related to the direct benefits of ICTs in terms of enhancing students teaching practice, enhancing students learning and improving their job satisfaction [11]. External factors including physical and moral motivational factors, as well as school support and encouragement, had a rational influence on the participant's use of ICT for educational purposes. ICTs is also used as a tool of intrinsic motivation for early language learners. Modern children are aware of technology and the internet, they find excitement in the lessons [12]. They showed attitude towards the use of ICTs and became more positive and also had experienced it themselves. This explains the relationship between motivation and the use of ICTs.

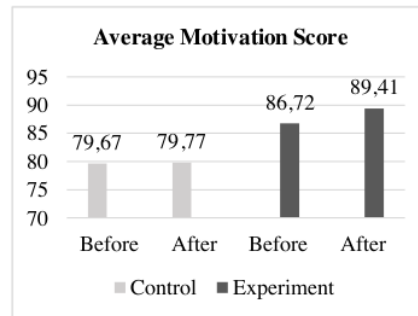


Figure 1. Average motivation score comparison between experiment and control group based on pre-test and post-test score.

⁹ The result of the gain score test results in table 6 shows that there are some distinctions on literacy improvement between the control group and the experimental group. The findings are based on sig output (p) 0.006 or less than 0.05.

Table 6 the result of Anova gain score on the literacy test ⁵

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	816,05	1	816,05	8,32	0,006
Within Groups	5400,21	55	98,19		
Total	6216,26	56			

Table 7 the result of Paired Samples t-Test on literacy

Mean	Std. Dev	95% Conf. of Diff		t	df	Sig.
		Lower	Upper			
-17,68	10,12	-21,66	-13,67	-9,07	26	0,000

The finding is confirmed by the analysis result using paired samples t-test on table 7. It shows that there is remarkable literacy improvement in an experimental group that used Pojok Digital to support learning activity.

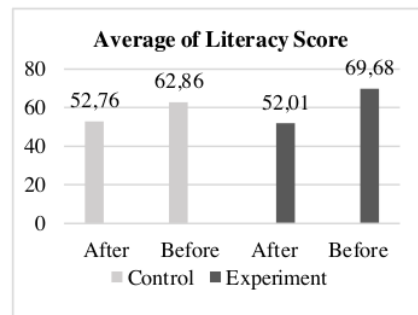


Figure 2. Literacy score average comparison between experiment and control group based on pre-test and post-test score. ²¹

Figure 2 shows the improvement of student literacy from each group. However, the improvement of the experimental class is more significant than the control group. The average score for literacy on experimental group peaks on 17,6 whereas the control group only increases 10,1 points. This result

shows students' literacy is significantly different because there are different experiences. ICTs-based learning can change students' experience in the classroom [13].

The internet as a part of ICTs is redefining the nature of reading, writing, and communication skills. The ICTs will continuously new literacy to successfully exploit students' potentials. New literacy skills and practices are required by each new ICTs as it emerges and evolves. New literacies are multiple lenses seeking to understand how to better support the students in the digital era. Learning activity which included ICTs-based media can change the learning pattern of teacher-centred to be student-centred. This is the result of the utilization of ICTs, students will be actively participated in searching and finding the information they are studying compared to only listen to the teacher's explanation which is a conventional learning pattern of face to face [14].

Tim GLN Kemendikbud explains that there are several important things to be done by the school to improve the quantity and variety of quality learning resources related to digital literacy in the school environment [15]. First, the addition of library digital literacy reading materials, second the provision of educational sites as a source of learning for school citizens. Third, the use of the educational application as a source of learning for school citizens. Fourth, provide wall magazine in class as well as in school. The implementation of Pojok Digital activities to increase motivation and literacy, the student can access sites and educational applications as learning materials such as *Jelajah Seru App*, *Anak Cerdas*, etc. Another learning resources, especially for science learning that has been developed to enhance students' motivation and literacy, is virtual laboratory-based learning module [16].

The teacher acts as a guide and motivates students in the student-centred learning activity. ICTs-based media provided in Pojok Digital creates learning activity to be more diverging which improves students' learning motivation. This is because students are no longer focusing on teacher's information but also have access to gain information in any other resource. Educational technology is very important as a tool that can be used to enhance learning as an integral part of the educational process [17].

Table 8. The result of interaction test

Source	Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1042.2 (a)	3	346.7	3.56	.020
Intercept	10879.7	1	10879.7	111.46	.000
Motivation	221.46	1	221.46	2.26	.138
Model	795.31	1	795.31	8.16	.006
Motivation*	11.31	1	11.31	.115	.736
Error	5172.11	43	97.7		
Total	16990.49	47			
Corrected Total	6215.26	46			

The result from the interaction test which is a test of between-subject effects by the help of SPSS 21 on table 8 shows that there are no interaction outcomes between Pojok Digital resources and learning motivation on student literacy. Moreover, motivation does not give any important outcomes for student literacy improvement. Thereupon, motivation and literacy improvement is affected by the use of Pojok Digital in the learning activity.

4. Conclusions

We have seen that the existence of Pojok Digital can improve students' motivation and literacy in the state elementary school of Pujiharjo 2. Learning by using ICT-based media gives an expressive outcome which can change learning pattern from teacher-centred to be student-centred. Therefore, it will increase student motivation and new literacy for students.

Furthermore, Pojok Digital is also a mean of government supporting programs about national literacy movement activity in primary school. One of which is the existence of digital literacy.

Through Pojok Digital, students are provided to access any helpful sites and applications of learning to shape critical thinking, creative, and smart in accessing information.

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