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The Influence of Interactive Teaching Materials Based on *Tpack* To Ability Literacy and Learning Outcomes Student Class XI IPA 1 SMA Negeri 4 Sigi on the Drama Material The End of the Tyrant

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ABSTRACT

This study aims to analyze the influence of the use of interactive teaching materials based on *TPACK* (*Technological Pedagogical Content Knowledge*) on students' literacy skills and learning outcomes. class XI IPA 1 SMA Negeri 4 Sigi on the material Drama Akhir Sang Tirani . The background of this study is based on the need for learning innovations that are able to integrate technology, pedagogy, and content effectively in improving the quality of learning in the digital era. The research method used is the method quantitative through quasi-experimental with *pretest-posttest control group design* . The research subjects consisted of two classes, namely the experimental class using *TPACK- based interactive teaching materials* and the control class using conventional teaching materials. The instruments used included a questionnaire. ability literacy and learning outcome test questions students. The results of the data analysis show that there are significant influence between the experimental class and the control class both in literacy skills and learning outcomes with distribution of questionnaire data in posttest class experiment 33 % in the very high category and 67% in the low category high . While in the posttest class control by 57% category high and 43% category medium . So that it is said results obtained class experiment more Good compared to class control . While the data on the results Study show student with average value on posttest class experiment more Good that is by 77 compared to class control with value 59. So the self in the experimental class experienced a higher increase compared to the control class. This finding shows that the integration of the *TPACK model* in the use of interactive teaching materials has a positive impact on improving literacy and student learning outcomes. Therefore, it is recommended for educators to adopt the *TPACK approach* in designing teaching materials in order to create more effective and relevant learning to the needs of the times.

Keywords: Interactive Teaching Materials , TPACK, Literacy , Learning Outcomes

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INTRODUCTION

Education is a business conscious , planned , and intentional For develop and foster source Power human . Education is carried out in form learning and learning process , with learner goals can develop the existing potential in himself . Education is a very important thing for sustainability life man (Mawarni et al. 2025) . If somebody have good education ,

then in a way automatic will have outlook knowledge good knowledge . This is show how very important education for life human and have various function For support the future someone . The world of education Of course close the relation with activity learning . (Kusumastuti , Lutfi, and Junaedi nd) , stated that " learning is a management process environment someone who with on purpose done so that allow he Study For do or show off behavior in demand certain ones too".

(Novika 2025) , stated that learning own components that consist of from : 1) source learning , 2) learning media , 3) facilities learning , 4) goals learning , 5) methods learning , 6) teachers, 7) students . Based on matter said , can known that source learning is one of part from component learning that is not may removed . Rohani (2019, p . 102), states that source Study can beneficial in things following . 1) Giving experience Study in a way direct and concrete to students . 2) Can present something that is not Possible held , visited , or seen in a way direct and concrete . 3) Can expand and broaden horizons . the dishes inside class . 4) Can provide accurate and up-to-date information . 5) Can help solve problem good (instructional) education in scope micro and also macro . 6) Can provide motivation positive , if arranged and planned its utilization in a way right . 7) Can stimulate For think , behave and develop more carry on.

Teaching materials are one of the a very influential source for achievement material and objectives learning especially in History learning . SMA Negeri 4 Sigi is one of the school middle schools in Sigi Regency with facility learning that is allowed said part big Still sourced from books package containing tend make student bored . That thing because of Contents books existing text tend thick , and sometimes the reviews inside No in accordance with rules good and correct Indonesian as well as Lots repetitive sentences . Material that is too Lots served in book text tend turn off interest and cause boredom . This is Of course bring impact psychological for student like the emergence of a feeling of laziness, difficulty in understand lesson so that influence ability literacy students who have an impact on achievement results learning that has not been maximum (Hapsari , Ayuni, and Sari 2025) . One of problem in History learning is lack of use source effective and efficient learning For support achievement objective learning . Based on problem mentioned , it is necessary hopefully a educator For try overcome matter the with apply sources and materials more learning nature interactive , as well as increase concentration participant educate to the material presented by the teacher so that participant educate capable understand draft material learning optimally , namely with try apply material learning that is of a nature Interactive (Ansya and Salsabilla 2025) .

According to Law No. 2 of 1985 (Suryatama , Saputra, and Siswanto 2025) , the purpose main education national is For increase intelligence nation with develop potential students to become obedient individual to God Almighty, have morals good , healthy , knowledgeable , skilled , creative , independent , and own awareness democratic and responsible answer as citizens . For reach objective This requires an optimal learning process , one of which is with apply Technological Pedagogical Content Knowledge (TPACK) approach that integrates technology in the learning process . Education in the 21st century

has different characteristics compared to with the previous era (Fajarwati , Nuryantini , and Windayani 2025) .

Learning 21st century refers to integration skills knowledge , skills , and attitudes , as well as mastery to Technology , Information, and Communication (ICT) (Askahar and Akbar 2025) . Skills This can developed through various approach learning that emphasizes activity , in line with competence and materials learning . Important skills in 21st century includes skills think level high (High Order Thinking Skills (HOTS), 4C skills (Communication, Collaboration, Critical Thinking, and Creativity), as well as skill in applying TPACK (Technological Pedagogical Content Knowledge) in learning , which is essential For prepare student face global challenges . Characteristics learning the 21st century demands a holistic approach learning capable push student in develop ability think level high and provides runway For skilled future generation in utilise progress Information and Communication Technology (ICT) which continues developing , which also affects various aspect life including learning (Echa Yunita) Pramesti , Prof. Dr. Anak Agung Gede Agung, M.Pd. , and Dr. I Gusti Agung Ayu Wulandari, S.Pd. , M.Pd. 2025) .

Progress fast technology moment This emphasize importance for teacher For own ability in use technology as tool Supporter in learning (Meyvita et al. 2025) Utilization of power point and learning videos become solution effective For overcome challenge in the learning process . The TPACK approach is a strategy for develop method learning that can produce achievement more learning significant . Integration between knowledge , technology , pedagogy , and materials knowledge No only increase meaning learning but also makes it more interesting and not monoton (Aulia et al. 2025) .

TPACK is approach integrated learning content knowledge , technology , and pedagogy . In the learning process with TPACK, the material learning delivered use various technology like animation , simulation , and video as media and resources Study (Marfu'ah , Darmawan, and Rinawati 2025) . An approach that emphasizes that learning involving development knowledge , understanding , and methods teaching . Concept TPACK plays role important in help student understand material learning and improving results learning . So , besides sued For designing TPACK -based teaching materials , it is hoped that teachers will also be able to For apply teaching materials based on technology especially in History learning (Wiratman , Bungawati , and Widianti 2025) . So that activity learning become interactive and not boring . Monotonous learning tend influential to ability literacy and results Study students . We know together that results Study is component end in the learning process which includes mark or aspect cognitive student as well as change attitude they after follow learning (Sipahutar and Saragih 2025) .

At State Senior High School 4 Sigi, especially in class XI IPA 1, it was found a number of constraint in the learning process . One of them is use inadequate teaching materials interesting and minimal ICT integration in learning , which causes activity student become not enough fun . Students tend passive Because domination the role of teachers in learning . When the teacher submits question , just A little students who demonstrate enthusiasm in answered , while others more tend to be silent. Situation This impact negative on ability literacy and results Study students , which is reflected from mark those who are still below

Learning Completion Criteria (KKM). Based on data from SMA Negeri 4 Sigi for Year Academic year 2023/2024 , in the even semester, as many as 58% of students No reach standard minimum completion (KKM).

Classical completion achieved If not enough from 15% of total students No reach KKM, when number This exceeded , this to signify that the learning process not optimal (Nasruddin et al. 2025) . The use of monotonous teaching materials not enough help students in learning . Learning seems passive because source Study most only from books package (Hafidah , Dewi, and Sholeha 2025) . This resulted in Power want to student in Study especially read material lesson become less and no development skills Study independent . This is of course it also affects the results Study participant educate (Hanipah and Ginting 2025) .

METHOD

Study This use method quantitative through *quasi experiment* (experiment) *quasi experiment*) . is an experiment that is not have characteristics design a real experiment , because the variables that must be controlled No allow or difficult For done . Type of design in study This is *non-equivalent pre-test post-test control group design.* This design is the design that will be compare a results intervention with a group similar and deep control grouping member sample in group experiments and controls No done in a way random (Warastuti, Prayitno , and Rahmawati et al.) .

FINDING AND DISCUSSION

RESEARCH RESULT

Validity test aiming For produce a truly powerful instrument capable measure aspects that should be measured , so that the data obtained can considered valid and reliable (Sugiyono , 2019). Instrument questionnaire related ability literacy validated by lecturer experts and tested on students . In the study This validity test used For know support a grain question to total score . For test validity every grain questions , the scores on the items correlated questions with total score . The height validity on a question the own great support to total score . Support every grain question stated in form correlation so that For get validity a grain question used formula correlation . Validity instrument This tested use method correlation *product moment* with calculation as following :

$$rxy = \frac{n(\sum xy)-(\sum x)(\sum y)}{\sqrt{n[(\sum x^2)-(\sum x)^2][n(\sum y^2)-(\sum y)^2]}}$$

Product Moment

Information:
r xy = correlation coefficient between variable x and variable y
x = item score
y = total score
n = Number of subjects

The interpretation of the magnitude of the correlation coefficient can be seen in Table 4.1.

Table 1. Categories Validity Question Items

Coefficient	Category
0.80 < rxy ≤ 1.00	**Very high**
0.60 < rxy ≤ 0.80	**Tall**
0.40 < rxy ≤ 0.60	**Enough**
0.20 < rxy ≤ 0.40	**Low**
0.00 ≤ rxy ≤ 0.20	**Very low**

As for the results from The validity of this instrument is calculated use formula correlation through SPSS, can seen with the following results :
Table 2. Validity test questionnaire ability literacy

Question Number	(n)Sig 5%	(n)Sig	Information
1	0.05	0.004	***Valid***
2	0.05	0.010	***Valid***
3	0.05	0.021	***Valid***
4	0.05	0.025	***Valid***
5	0.05	0,000	***Valid***
6	0.05	0.038	***Valid***
7	0.05	0.025	***Valid***
8	0.05	0.013	***Valid***
9	0.05	0.003	***Valid***
10	0.05	0.029	***Valid***
11	0.05	0.004	***Valid***
12	0.05	0.003	***Valid***
13	0.05	0.006	***Valid***
14	0.05	0.001	***Valid***
15	0.05	0.002	***Valid***
16	0.05	0.024	***Valid***
17	0.05	0,000	***Valid***

18	0.05	0.011	***Valid***
19	0.05	0.005	***Valid***
20	0.05	0.029	***Valid***
21	0.05	0.030	***Valid***
22	0.05	0.001	***Valid***
23	0.05	0.026	***Valid***
24	0.05	0.003	***Valid***
25	0.05	0.012	***Valid***
26	0.05	0.029	***Valid***
27	0.05	0.025	***Valid***
28	0.05	0.015	***Valid***
29	0.05	0.024	***Valid***
30	0.05	0.033	***Valid***
31	0.05	0.035	***Valid***
32	**0.05**	**0.014**	***Valid***

the value obtained Sig < 0.05, this means an ability questionnaire literacy declared valid and suitable for use as an instrument . While the ability instrument cognitive or results Study Students obtained validation as follows :

Table 3. Test of validity of question items

Question Number	**(n)Sig 5%**	**(n)Sig**	**Information**
1	0.05	0.001	***Valid***
2	0.05	0.009	***Valid***
3	0.05	0.015	***Valid***
4	0.05	0.005	***Valid***
5	0.05	0.001	***Valid***
6	0.05	0.021	***Valid***
7	0.05	0.022	***Valid***
8	0.05	0.008	***Valid***
9	0.05	0.026	***Valid***
10	0.05	0.047	***Valid***
11	0.05	0.011	***Valid***
12	0.05	0.005	***Valid***
13	0.05	0.027	***Valid***
14	0.05	0.020	***Valid***
15	0.05	0.013	***Valid***
16	0.05	0.004	***Valid***

17	0.05	0.047	***Valid***
18	0.05	0.015	***Valid***
19	0.05	0.003	***Valid***
20	0.05	0.004	***Valid***
21	0.05	0.017	***Valid***
22	0.05	0.015	***Valid***
23	0.05	0.013	***Valid***
24	0.05	0.014	***Valid***
25	0.05	0.001	***Valid***
26	0.05	0.001	***Valid***
27	0.05	0.010	***Valid***
28	0.05	0.039	***Valid***
29	0.05	0.032	***Valid***
30	**0.05**	**0.001**	***Valid***

Based on the validity test results data above can seen There are 30 items with mark Significance < 0.05, so the question item the declared valid.

Reliability is accuracy instrument For used repeatedly (Sugiyono , 2019). Reliability test aiming know consistency from A tool measuring For measure same object several times and tends to generate relative data same . The reliable test technique used that is *Cronbach's alpha* . The results of the reliability test For questionnaire ability literacy student can seen in the table following :

Table 4. Reliability test of the ability questionnaire literacy

Reliability	**Information**
0.951	**Reliable**

Based on the data obtained, the reliability was 0.951 and was included in the reliable category, while the instrument results The following data was obtained from the study :

Table 5. Reliability test of question items test

Reliability	**Information**
0.948	**Reliable**

Based on the data obtained reliability of 0.948 and includes category reliable , thing This means the question instrument tests and instruments ability literacy stated reliable For used in a way repetitive .

Normality testing serves to show the distribution of data in the sample group, so that it can be known whether the data is taken from a normal population or not . The results of the normality test obtained the following results:
Table 6. Normality Test

Kolmogorov-Smirnova					Shapiro Wilk		
Statistical Treatment			df	Sig.	Statistics	df	Sig.
results	pretest control (ability literacy)	.100	30	.200*	.981	30	.845
	posts control (ability literacy)	.110	30	.200 *	.966	30	.441
	pretest experiment (ability) literacy)	.110	30	.200 *	.967	30	.472
	posts experiment (ability) literacy)	.154	30	.069	.925	30	.035
	pretest control (results) Study)	.152	30	.074	.953	30	.205
	posts control (results) Study)	.203	30	.003	.917	30	.022
	pretest experiment (results) Study)	.164	30	.039	.920	30	.027
	posts experiment (results) Study)	.173	30	.023	.927	30	.040

Based on the data obtained significance a number of group < 0.05 so the data is distributed abnormal .

Homogeneity test done For know whether variance same data group or No with use *levene test* , purpose from homogeneity test This For know whether group sample originate from the same population or own the same ability . There are homogeneity test results that is :
Table 7. Homogeneity Test

Levene Statistics			**df1**	**df2**	**Sig.**
results	Based on Mean	2.280	7	232	**.029**
	Based on Median	1,818	7	232	**.085**
	Based on Median and with adjusted df	1,818	7	202.118	**.086**
	Based on trimmed mean	**2.259**	**7**	**232**	**.031**

After homogeneity test was carried out show significance of 0.00 < 0.05 which means that the data is not homogeneous .

Distribution ability literacy reviewed from use interactive teaching materials based on *TPACK* with those who use *Printed Teaching Materials & PPT Slides.*
Table 8. Distribution of Abilities Literacy Student

Treatment			Category Ability Literacy	Amount	Percentage (%)
Ability Literacy	Teaching materials *Print & Slide PPT* (Control)	Pretest	Very high	0	**0**
			Tall	16	**50**
			Currently	16	**50**
			Low	0	**0**
		Posts	Very high	0	**0**
			Tall	18	**57**
			Currently	14	**43**
			Low	0	**0**
	Interactive teaching materials based on *TPACK* (Experiment)	Pretest	Very high	0	**0**
			Tall	15	**47**
			Currently	17	**53**
			Low	0	**0**
		Posts	Very high	10	**33**
			Tall	22	**67**
			Currently	0	**0**
			Low	**0**	**0**

Based on Table 8, it can be explained that the distribution of abilities literacy in the control group had the same average between the pretest and posttest, with the highest distribution in the high category, while in the experimental group, in the pretest and posttest the highest data distribution was in the high category, but in the posttest group there was a very high category of 33%, greater than the other groups.

DISCUSSION

Learning history at school often considered monotonous and boring Because focus on memorization dates , events and names figure who is considered difficult For understood students . One of the method For overcome matter the is with use interactive teaching materials . Interactive teaching materials is material designed learning with elements that make it possible student involved straight away , good both mentally and physically physical , in the learning process (Rozi and Najiyah 2025) .

History subjects are often considered monotonous because they contain long narratives and are less interactive. This study found that the use of interactive teaching materials TPACK -based can help For addressing these challenges through a real-world experience-based approach. As stated by (Sutarjo et al. 2025) , experience-based learning can increase students' absorption of information because the relevance of the material taught is more felt in their lives.

Use interactive teaching materials in learning history No only make material more interesting , but also giving experience real for student so that make learning more meaningful (Madina et al. 2021) . In addition , the use of Interactive teaching materials can

also be used increase understanding student about digital and stimulating technology involvement student in the learning process . With use interactive teaching materials , such as videos, games , or simulation history , students more interested and more active in follow learning . Use of interesting visual media , such as map interactive or digital timeline, can help student imagine and understand incident history with more clear (Siswanto, Kristiawan , and Zarkasyi 2025) .

Interactive teaching materials often allow student Work in group , finish task or challenge together , so that can increase Work same and communication between students . Interactive teaching materials give chance for student For Study with speed and manner they Alone (Isma, Nasir, and Sadriana Ayu 2025) . For example , e-learning modules or application learning that can accessed When just give flexibility in learn . This is very important For Motivate students to continue study outside formal class hours and deepen understanding they to material . Of course . in matter This teacher is holding role important as facilitator bridging learning student with all form source Study in reach objective learning (Musyarofah and Fitrihidajati 2025) .

The results of this study indicate that the use of Interactive Teaching Materials TPACK -based learning has a significant influence on improving learning ability. literacy student so that also has an impact on the results learning . Based on the data obtained, students in the experimental class showed a higher average score in the ability questionnaire. literacy is at high category of 67% and very high category of 33%, while in the control group the high and medium categories were 50% each . The results of the statistical analysis support that the use of Interactive Teaching Materials TPACK -based significantly affects the ability literacy and results student learning . This finding is in accordance with results study (Sholikhah and Prayitno 2025) , that interactive teaching materials are learning resources that contain learning materials and are designed to actively involve students in the learning process.

Interactive teaching materials are teaching materials that combine several interactive learning media (audio, video, text, or graphics) to control a command or natural behavior in an ongoing learning activity, so that a 2-way relationship will occur between the teaching materials and students. (Kero et al. 2025) . So , the thing is the can stimulate student do activity literacy . In line with what was stated by (Triwahyuni et al. 2025) , where they explained that interactive teaching materials create learning experiences that actively involve students , with direct feedback that helps improve understanding and retention of information. So , the approach Study using packaged TPACK in form interactive teaching materials No only help increase ability literacy student but also influential to results Study (Diah Rusmala Dewi 2019) .

(Pravitasari et al. nd) in his research state that interactive teaching materials , such as application learning digital- based , interactive video , or quiz , allows student For involved in a way direct in the learning process . Involvement active This can make they more focused and motivated For understand material with more well , which in turn increase ability literacy they . Interaction in teaching materials allow student For see connection between draft in a way more clear . For example , in learning literacy , interactive teaching materials

Can provide examples practical or simulation that makes it easier understanding text , word, or draft learning others . This speeds up understanding and enriching knowledge they (Wahyuni and Wahyuni 2025) .

One of profit interactive teaching materials is his ability give bait come back in a way instant . Students can know whether they understand material with Correct or no , and can quick repair error . This is support development literacy with give chance For Study from errors and fixes understanding they (Lisda 2025) . Use interactive teaching materials based on technology can also develop skills students' digital literacy . In the digital era such as Nowadays , digital literacy is very important , and interactive teaching materials give opportunity for student For hone skills this , which in the end expand coverage literacy they (Lusiana Arie Wijayanti and Wahyudi Wahyudi 2025) .

(Qorina , Fakhriyah, and Siti Masfuah 2025) , interactive teaching materials often can customized with need diverse students . With various feature like text that can read with voice or animation that explains a concept , this teaching material can help student with various style learning (visual, auditory , kinesthetic), which in the end increase understanding they to the material being taught . In general Overall , interactive teaching materials No only increase literacy academic , but also provide skills and motivation more for student For Keep going learn and grow (Alfi and Tralisno 2025) .

Study This is not the only one research that implements source Study interactive TPACK based . It's just that in study This researcher try apply learning with teaching materials that have been designed and has been tested try it previously on the teacher profession program and has validated by lecturer experts and expert assessor teachers in his field . In research This is the teaching material used is gathering sources material Indonesian History lesson for class XI with theme beginning occupation Japan in Indonesia until end government Japan in Indonesia. Sources learning that exists innovated and created in accordance need participant educate . Interactive teaching materials This is TPACK based made with utilizing the Canva and Cap-Cut application media . Not only that , the teaching materials applied in study this is also expected can be one of reference student in Study anytime and anywhere . Students can access this teaching material with various convenience without must bring book package Because this teaching material is interactive teaching materials based on technology . Although student Far from range internet network but Can access it with method download the teaching materials Then save it in gadget memory .

Based on research that has been done , can it is said that use interactive teaching materials TPACK -based is very helpful for teachers in convey concepts material History learning . Additionally , use interactive teaching materials This direct student For more wise in using gadgets. With access this teaching material via smartphone can reduce dependence student towards Online Games. This is one of the reason study This done Because researcher want to innovate and develop skills digital technology in the world of education and teaching .

In general general , usage interactive teaching materials of course own Lots benefits , but in its implementation Of course there is a number of challenges faced like limitations

access to adequate devices and technology . Not all school or student own access to computer , tablet, or stable internet connection . This is can cause inequality in chance study , where students in the area certain or with condition poor economy lucky No Can utilise interactive teaching materials with maximum . Usage Interactive teaching materials are also often required skills technology certain , good from side student and also Teacher . Student Possible No used to with tool or application new , while teachers also need skilled in manage and utilize technology For support learning .

CONCLUSION

There is influence significant from use of Interactive Teaching Materials based on *TPACK* towards ability literacy student with distribution of questionnaire data in posttest class experiment 33 % in the very high category and 67% in the low category high . While in the posttest class control by 57% category high and 43% category medium . So that it is said results obtained class experiment more Good compared to class control . There is an influence significant from use of Interactive Teaching Materials based on *TPACK* towards results Study student with average value on posttest class experiment more Good that is by 77 compared to class control with value 59. There is an influence significant from use of Interactive Teaching Materials based on *TPACK* towards ability literacy and results Study student can seen from statistical data results calculation questionnaire ability literacy and calculation acquisition average value between class control and class experiments that have difference significant .

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