The Influence of the RADEC Learning Model Based on the TPACK Approach on the Improvement of Cultural Literacy for SMP/MTs Students

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ABSTRACT

This study aims to analyze the influence of the RADEC (Read, Answer, Discuss, Explain, and Create) learning model based on the TPACK (Technological Pedagogical Content Knowledge) framework on improving students' cultural literacy. This study used a quasi-experimental design with a pretest-posttest control group design model. The research subjects consisted of 65 students, 33 students each from SMP Negeri 23 Medan and 32 students from MTs Miftahussalam Medan. The experimental group was taught using the TPACK integrated RADEC model, while the control group used conventional lecture-based methods. Data was obtained through a cultural literacy test in the form of writing expository texts about local cultural values. Data analysis was carried out using SPSS 27 through normality tests, homogeneity tests, and independent sample t-tests. The results showed a significant increase in the cultural literacy ability of the experimental group compared to the control group. At SMP Negeri 23 Medan, the experimental group obtained an average posttest score of 87.12 compared to 61.36 in the control group. Meanwhile, at MTs Miftahussalam Medan, the average posttest of the experimental group reached 84.38 compared to 61.25 in the control group. These findings prove that the application of the TPACK-based RADEC model is effective in increasing student engagement and deepening their understanding of local culture through expository writing. The results of this study have practical implications for educators in designing technology-based learning that is contextual with local culture to strengthen the competencies of 21st century students.

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1. INTRODUCTION

The development of technology and digitalization has brought significant changes to modern educational paradigms, particularly in the era of Society 5.0, which emphasizes the integration of humans and technology(Anugerah, 2023; Gazali & Sumarsono, 2025; Hasyim dkk., 2025; Indriana, 2024; Khairunnisa dkk., 2024; Pratama dkk., 2024; Syafitri dkk., 2024). This shift affects all aspects of life, including education, where teachers are required to adapt and enhance their pedagogical competence and digital literacy to ensure that learning remains relevant to the needs of the 21st century (Lasi dkk., 2014a; Zizic dkk., 2022a). However, in reality, many teachers still face difficulties in designing innovative, engaging, and contextual learning experiences, causing the learning process to often become monotonous and less stimulating for students (Feng & Xiao, 2024a)

The learning model has undergone many beneficial paradigm shifts as a result of technological advancements and digitalization, especially in relation to the millennial era. This paradigm shift affects every aspect of human life in every generation (Lasi dkk., 2014b; Zizic dkk., 2022b)(Zizic dkk., 2022b). The monotony of the learning process is caused by the teacher's inability to incorporate learning into an original and creative learning model (Feng & Xiao, 2024b; Tamsah dkk., 2021). In the society 5.0 era, teachers must be able to assist students in developing their competencies. One characteristic of the society 5.0 era is the integration of humans and technology (Feng & Xiao, 2024b; Yaras & Öztürk, 2022). The ability of teachers to develop digital literacy and technology is based on a survey conducted by the Indonesian Internet Service Providers Association (APJII) in 2024.
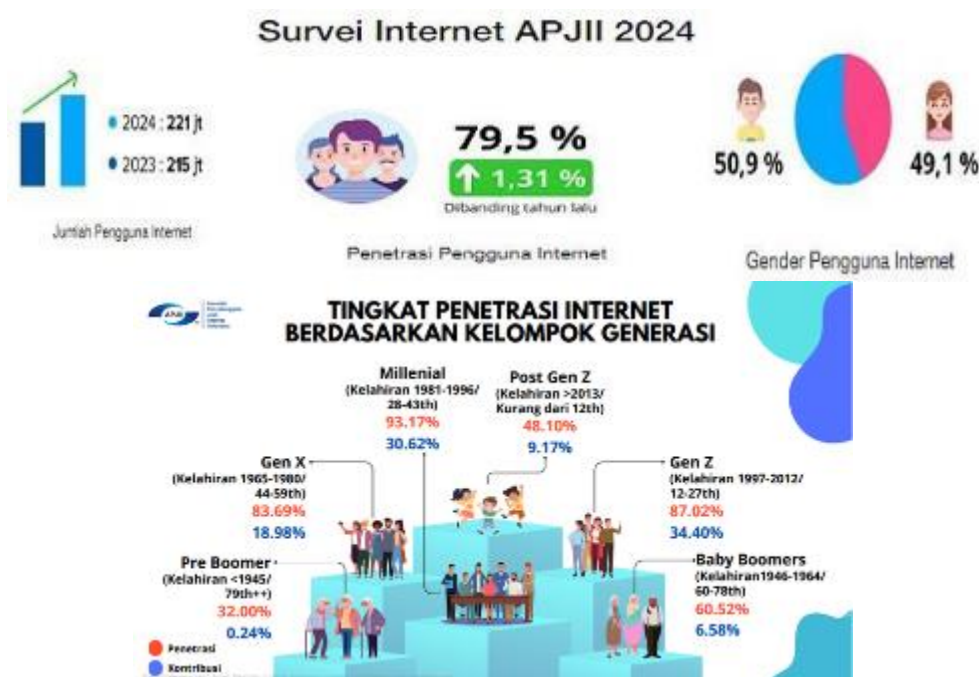

Image 1. APJII Survey 2024
Source: https://apjii.or.id

It is recorded that the number of internet users in Indonesia in 2024 reached 221,563,479 people out of a total population of 278,696,200 people in Indonesia in 2023. According to the 2024 Indonesia Internet Penetration Survey released by APJII, the internet penetration rate in Indonesia reached 79.5%. Compared to the previous period, there was an increase of 1.4%. Based on gender, the contribution of internet penetration in Indonesia is largely from males at 50.7% and females at 49.1%.

Table 1. Age Range of Internet Users in Indonesia

Age Range	Kategori	%
58-43	Gen X (born 1965-1980)	18,98%
42-27	Millennial generation (born 1981-1996)	30,62%.
26-11	Gen Z (born 1997-2012)	34,40%
<1	Post Gen Z (born after 2023)	9,17%

Meanwhile, in terms of age, the majority of internet users are Gen X at 18.98%, Millennials at 30.62%, Gen Z at 34.40%, and Post Gen Z at 9.17%. Ibrahim and Haerulla (2023) state that the RADEC (Read-Answer-Discuss-Explain-and-Create) learning model is a learning model that uses its stages as the name of the model itself. The RADEC learning model is one of the alternative learning models suitable for the conditions in Indonesia. The syntax of the RADEC model is easy for primary and secondary education teachers to memorize (Agustin dkk., 2021)

(Yulianti dkk., 2022) state that the RADEC learning model can motivate students to engage actively in learning activities, learn independently, contextualize student knowledge with the material being studied, connect teaching materials to real-life situations, focus on students, and be creative. The use of the RADEC model through the TPACK (Technological Pedagogical Content Knowledge) approach. The use of the RADEC model through the TPACK (Technological Pedagogical Content Knowledge) approach integrates a conceptual framework that shows the relationship between three types of knowledge that teachers must master, namely technological knowledge, pedagogical knowledge, and content knowledge (Damariswara & Aka, 2024). The digital era has an impact on the world of education (Singh, 2021). Many characteristics of students are closely related to technology, as seen from educators' ability to integrate the TPACK approach (Voithofer & Nelson, 2021). This is supported by (Durham, 2024) stating that this integration of technology encourages teachers to explore how technology and education can be leveraged through the utilization of the technological pedagogical content knowledge (TPACK) framework.

The problems in the education sector, especially in the cultural literacy skills of students, are still low. The lack of awareness of national identity, particularly in the concept of cosmopolitanism, and the 'one-way street' communication perspective result in Indonesia being merely a 'passive recipient.' This situation is also influenced by lifestyle and the rapid processing of global information that is quickly absorbed by students, leading to a fragile sense of nationalism and culture of Indonesia, which automatically erodes and undermines cultural identity in our education system (Setiawan, 2020). One of the texts in Indonesian is the Expository Text, which can foster cultural literacy among students. Cultural literacy begins from the concept of cosmopolitanism. According to (Gannaway, 2009) cosmopolitanism is a rational humanistic thought, which is a value built within each individual through encounters and clashes of cultures.

The concept of cosmopolitanism according to (Johnson, 2014) is the embodiment of a person's identity (ethnic, national, cultural) and cultural capital that is accumulated through experiences with the process of education. Fostering a cultural climate is the instilling of love for Indonesian culture to students (Arianto & Wulandari, 2023). Viewed from the aspect of cultural literacy, Indonesian students also face a similar problem, namely the low cultural literacy of students regarding Indonesian culture itself, as they have been affiliated with foreign cultures, one of which is K-pop.

Cultural literacy is one dimension of multiliteracy, where the goals of literacy education vary in relation to different areas of life (B dkk., 2023). Through cultural literacy, students will be able to acquire maximum cultural literacy skills, thereby enhancing their social interactions and increasing their knowledge of the norms that apply within their own cultural context. According to (Arsal dkk., 2023) culture is the local wisdom of a society that cannot be separated from the language of that society, which is passed down through generations. Cultural values related to local wisdom that can be included as content in the Indonesian language learning such as factual texts and literature in its presentation, proverbs, habits, traditions, sayings, arts, and folk games. Cultural literacy is an essential skill in understanding and appreciating culture as a national identity. This is in line with research

(Arsal dkk., 2023; Rohman, 2024) which shows that improving students' cultural literacy through a contextual approach can strengthen awareness of local values.

The aim of this study is to analyze the impact of implementing the RADEC (Read, Answer, Discuss, Explain, and Create) learning model based on the TPACK (Technological Pedagogical Content Knowledge) approach on improving the literacy skills of junior high school students (SMP/MTs). This research seeks to determine the extent to which the TPACK-integrated RADEC model enhances students' ability to comprehend and interpret local cultural values through expository writing. Furthermore, the study aims to describe students' perceptions of the implementation of this learning model within the context of Indonesian language ins

2. METHODS

This study employed a quasi-experimental method with a *pretest-posttest control group design*, aiming to determine the effect of implementing the RADEC (Read, Answer, Discuss, Explain, and Create) learning model based on the TPACK (Technological Pedagogical Content Knowledge) approach on improving students' writing skills in cultural literacy expository texts. The subjects of this study were eighth-grade students from SMP Negeri 23 Medan and MTs Miftahussalam Medan, with a total of 65 students divided into two groups: an experimental class and a control class. The experimental class received treatment using the RADEC learning model integrated with the TPACK approach, while the control class was taught using conventional lecture-based learning. The sampling technique used was random sampling, where each student had an equal opportunity to be selected as part of the study sample (Sugiyono, 2017).

Data were collected through written tests and questionnaires. The written test was used to measure students' ability to write expository texts containing cultural values, while the questionnaire was used to assess students' perceptions of the implementation of the learning model. The research instruments were tested for content and construct validity, and their reliability was measured using Cronbach's Alpha coefficient to ensure internal consistency. The data were analyzed using the Normality Test (Kolmogorov-Smirnov and Shapiro-Wilk), Homogeneity Test (Levene's Test), and Independent Samples T-Test to determine the differences in mean scores between the experimental and control groups. Data analysis was carried out using SPSS version 27 software to determine the effectiveness of the RADEC learning model based on the TPACK approach in improving students' cultural literacy compared to conventional learning.

3. FINDING AND DISCUSSION

This research was conducted at SMP Negeri 23 Medan and MTs Miftahussalam Medan. At SMP Negeri 23 Medan, class VIII-G served as the control class and class VIII-H as the experimental class. Next, at MTs Miftahussalam Medan, class VIII-B served as the control class and class VIII-C as the experimental class. The experimental class students at SMP Negeri 23 Medan and MTs Miftahussalam Medan were treated using the RADEC learning model based on the TPACK approach on the subject of expository texts in cultural literacy learning, while the control class received treatment using conventional learning in the form of lectures.

SMP Negeri 23 Medan is a junior high school accredited with a B and is located at Jl. Perguruan Tinggi Swadaya, Binjai, Kec. Medan Denai, Kota Medan, Province of North Sumatra. SMP Negeri 23 Medan is under the auspices of the Education Office of North Sumatra Province, which was established on November 7, 1983, with the principal named Mrs. Sarifah Hanum, M.Pd. The school is strategically located, making it accessible and visitable from anywhere. This school is equipped with facilities that include 30 classrooms, 1 laboratory, a library, and a health room. Additionally, the school provides facilities for student interests and talents by organizing extracurricular activities such as scouting, sports, and arts that offer experiences outside of formal learning processes.
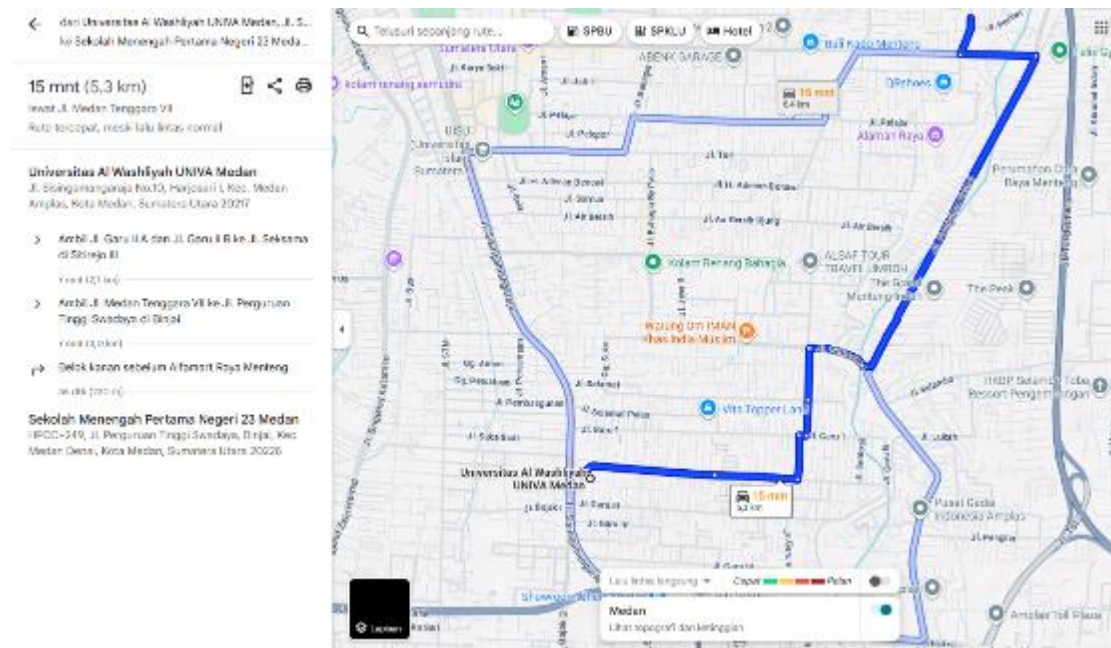
Figure 2. Screenshot of Google Maps depicting the distance from the Research College to SMP Negeri 23 Medan

This research was also conducted at MTs. Miftahussalam Medan, which is a madrasah equivalent to a junior high school, accredited A, located at Jl. Darussalam No.26 abc, Sei Sikambing D, Kec. Medan Petisah, Kota Medan, North Sumatra Province. MTs. Miftahussalam Medan operates under the auspices of the Ministry of Religious Affairs and the Education Office of North Sumatra Province. Established on January 1, 1970, MTs. Miftahussalam Medan is one of the oldest madrasahs in Medan, with the principal named Mr. Muzakkir M. Adam, S.Ag. The school's location is very strategic, allowing access and visitation from any direction. The school is equipped with facilities consisting of 9 classrooms, 1 computer laboratory, a science laboratory, a library, and a health unit. Additionally, the school has the motto "Creative in Learning, Excellent in Achievement," which provides facilities for students' interests and talents by conducting extracurricular activities on Fridays, Saturdays, and Sundays.
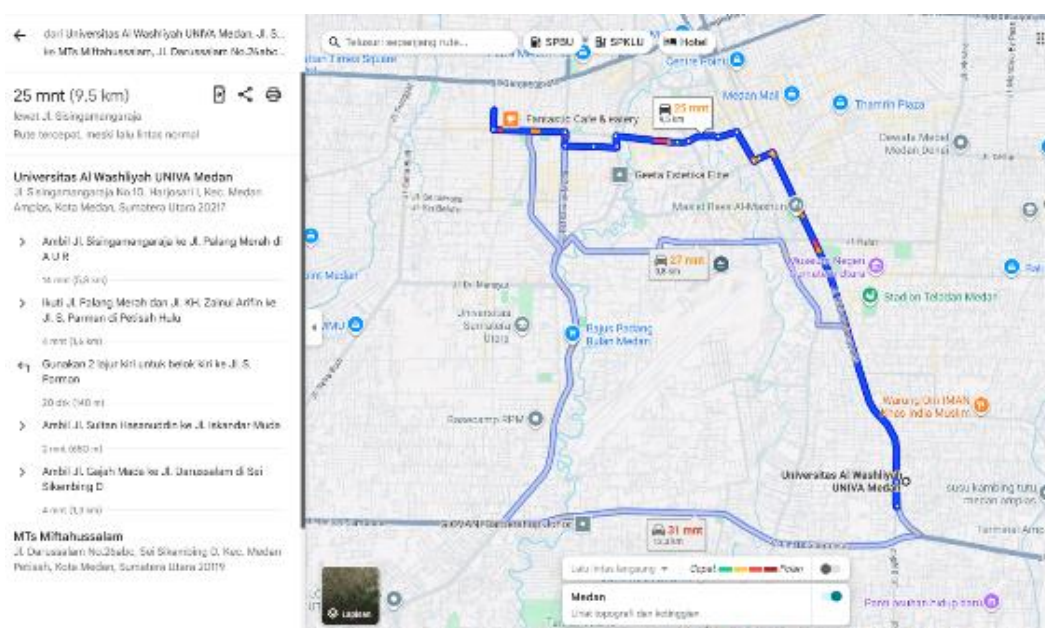
Figure 3. Screenshot of Google Maps depicting the distance from the Research College to MTs. Miftahussalam Medan.

This research uses experimental research. This experimental research was conducted to determine the effect of treatments deliberately given by the researcher. This method is carried out to find out the impact or effectiveness of the RADEC learning model based on the TPACK approach on improving writing skills on the cultural literacy expository text material by eighth-grade students at SMP Negeri 23 Medan and MTs. Miftahussalam Medan. This research was conducted over three months from July to September 2025. The data in this study were obtained from the results of pre-tests and post-tests conducted in the experimental class and the control class. The pre-test is a skills test given to students before they receive treatment, while the post-test is conducted after students receive treatment to measure the impact of learning in the classroom.

The results of the pretest and posttest scores in the research on the control class and the experimental class were calculated using the independent samples t-test formula. Before the research was conducted, the researcher performed validity and reliability tests on the questions given to the students. Then, the research was conducted and the test results from the control class and experimental class were recalculated using Normality and Homogeneity tests using SPSS 27 software. The test was conducted to help the researcher determine the effect of the RADEC learning model based on the TPACK approach on students' abilities in cultural literacy explanatory text in the Indonesian language subject.

Table 1. Pretest Results Data of Control Class and Experiment Class of Students at SMPN 23 Medan

Class	Average	Highest Score	Lowest Score
Control Class	52,27	70	35
Experiment Class	53,48	70	35

Based on Table 1, it can be seen that the average initial ability of students in the control class is 52.27, with the highest score being 70 and the lowest score being 35. Meanwhile, in the experimental class, the average initial ability of students is 53.48, with the highest score being 70 and the lowest score being 35.

Table 2. Pretest Results Data of Control Class and Experiment Class of Students at MTs Miftahussalam Medan

Class	Average	Highest Score	Lowest Score
Control Class	52,50	70	35
Experiment Class	53,75	70	35

Based on Table 2 above, it can be concluded that the students' ability to write expository texts on cultural literacy before the treatment was applied to the control class at MTs. Miftahussalam (Class VIII-B) had a mean pre-test score of 52.50; the highest score was 70; the lowest score was 35. In the experimental class (Class VIII-C), the mean pre-test score was 53.75; the highest score was 70; the lowest score was 35.

Table 3. Postest Results Data of Control Class and Experiment Class of Students at SMPN 23 Medan

Class	Average	Highest Score	Lowest Score
Control Class	61,36	75	50
Experiment Class	87,12	100	70

Based on Table 3, it can be seen that the average post-test ability of students in writing cultural literacy expository texts at SMP Negeri 23 Medan in the control class (VIII-H) is 61.36 with the highest

score of 75 and the lowest score of 50. Meanwhile, in the experimental class (VIII-G), the average post-test score of students is 87.12 with the highest score of 100 and the lowest score of 70.

Table 4. Postest Results Data of Control Class and Experiment Class of Students at MTs Miftahussalam Medan

Class	Average	Highest Score	Lowest Score
Control Class	61,25	75	45
Experiment Class	84,38	100	65

Based on Table 3 of the Post-Test Data of the Control Class and the Experimental Class of Students at MTs Miftahussalam Medan, it was found that the average ability of students in writing cultural literacy expository texts after the post-test at MTs Miftahussalam Medan in the control class (VIII-B) is 61.25, with the highest score being 75 and the lowest score being 45. Meanwhile, in the experimental class (VIII-C), the average post-test score of the students reached 84.38, with the highest score being 100 and the lowest score being 65.

After obtaining pretest and posttest scores data from the control class and experiment class at SMP Negeri 23 Medan and MTs Miftahussalam, it was followed by normality testing for each school using the Kolmogorov-Smirnov test formula with SPSS 26 for Windows, followed by homogeneity testing and T-test. The results of the normality test can be seen in Table 5.

Table 5. Normality Test Data for Students of SMPN 23 Medan

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Control Class Pretest	.107	33	.200*	.960	33	.254
Control Class Posttest	.154	33	.046	.951	33	.145
Experimental Class Pretest	.105	33	.200*	.957	33	.216
Posttest Experiment Class	.174	33	.012	.940	33	.066

Based on the Shapiro–Wilk normality test results conducted using SPSS 27, the Control Class Pretest (VIII-H) shows p = 0.254 and the Control Class Posttest (VIII-H) shows p = 0.145, both greater than 0.05, which means that the pretest and posttest data of the control class follow a normal distribution. The Experimental Class Pretest (VIII-G) shows p = 0.216 and the Experimental Class Posttest (VIII-G) shows p = 0.066, both greater than 0.05, which means that the pretest and posttest data of the experimental class also follow a normal distribution. Because all p values are greater than 0.05, the assumption of normality for all pretest and posttest data in both classes is satisfied.

Table 6. Normality Test Data for Students of MTs. Miftahussalam Medan

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Control Class Pretest	.100	32	.200*	.959	32	.264
Control Class Posttest	.167	32	.024	.939	32	.069
Experimental Class Pretest	.112	32	.200*	.957	32	.220
Posttest Experiment Class	.123	32	.200*	.957	32	.223

Based on the results of the Shapiro-Wilk normality test on the data of MTs. Miftahussalam Medan students, it can be concluded that the four groups of research data are normally distributed. The

significance values (Sig.) for the control class pretest (VIII-B) is 0.264, and the control class posttest (VIII-B) is 0.069, the experimental class pretest (VIII-C) is 0.220, and the experimental class posttest (VIII-C) is 0.223. Because all these significance values are greater than the significance level of 0.05, the null hypothesis stating that the data is normally distributed is accepted.

After conducting a normality test on the pre-test and post-test scores from the control class and the experimental class at SMP Negeri 23 Medan and MTs. Miftahussalam Medan, it can be determined as presented in Table 5 and Table 6 that the significance values are greater than (0.05) and it is stated that the data is normally distributed. Thus, all data meet the normality assumption which is a fundamental requirement for further parametric statistical analysis.

Table 7. Homogeneity Test Data of SMPN 23 Medan Students

		Levene Statistic	df1	df2	Sig.
Pretest	Based on Mean	.028	1	64	.868
	Based on Median	.011	1	64	.916
	Based on Median and with adjusted df	.011	1	64.000	.916
	Based on trimmed mean	.026	1	64	.873

Based on the results of the homogeneity test of students from SMP Negeri 23 Medan, the variance shows a Levene Statistic value of 0.028 with a significance (Sig.) of 0.868. It can be concluded that the pretest and posttest data have homogeneous variance. A significance value (Sig.) > 0.05 indicates that there is no significant difference in variance between the two groups of data. Therefore, the assumption of homogeneity of variance is met, which means that the data used in this analysis can be considered to come from a population with the same variance, thus valid.

Table 8. Homogeneity Test Data of MTs. Miftahussalam Medan

	Levene Statistic	df1	df2	Sig.
Based on Mean	.013	1	62	.909
Based on Median	.000	1	62	1.000
Based on Median and with adjusted df	.000	1	61.371	1.000
Based on trimmed mean	.010	1	62	.919

Based on the results of the homogeneity of variances test (Levene's Test) on the pre-test data of students at MTs. Miftahussalam Medan, it can be concluded that both groups, namely the experimental class and the control class, have homogeneous variances. This is indicated by the significance value (Sig.) of 0.909 > 0.05, which allows us to conclude that the samples come from the same population or are said to be homogeneous. After conducting the normality test and homogeneity test on the research data at SMP Negeri 23 Medan and MTs Miftahussalam, which showed that the data were normally distributed and the data variances were stated to be homogeneous, the T-test was then conducted to determine whether there is an effect of the RADEC learning model based on the TPACK approach on students' ability in literary cultural expository text in the Indonesian Language subject. The researcher conducted hypothesis testing using the independent samples t-test formula in SPSS 27.

After conducting normality tests and homogeneity tests on the research data at SMP Negeri 23 Medan and MTs Miftahuusalam, where the data was normally distributed and the variance was declared homogeneous, a T-test was then conducted to determine whether there is an influence of the RADEC learning model based on the TPACK approach on students' abilities in the expository text

literacy culture material in the Indonesian language subject. The researcher conducted hypothesis testing using the independent samples t-test formula in SPSS 27.

Table 9. T-Test Data of Students at SMPN 23 Medan

	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
Equal variances assumed	.035	.852	12.255	64	.000	5.152	.420	4.312	5.991
Equal variances not assumed			12.255	63.834	.000	5.152	.420	4.312	5.991

Based on the results of the Independent Samples T-Test presented, it can be concluded that there is a statistically significant difference between the posttest scores of the two independent groups. This is indicated by a two-tailed significance value (p-value) of 0.001, which is well below the standard alpha of 0.05.

Before performing the t-test, Levene's Test is used to test the assumption of equal variances. The results show a significance value (Sig.) of 0.852, which means there is no evidence to reject the null hypothesis that the variances of the two groups are the same (homogeneous). Therefore, the interpretation of the results refers to the line 'Equal variances assumed'. The mean difference between the two groups is 5.152. The 95% confidence interval for this mean difference is between 4.312 and 5.991, which does not include the number zero. This further strengthens the conclusion that the observed difference is real and not due to chance.

Table 10. T-Test Data of Students at MTs. Miftahussalam Medan

	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
Equal variances assumed	.327	.570	9.969	62	.000	4.625	.464	3.698	5.552
Equal variances not assumed			9.969	61.128	.000	4.625	.464	3.697	5.553

Based on the results of the Independent Samples T-Test, it can be concluded that there is a statistically significant difference in post-test results between the experimental group and the control group. This is evidenced by a Sig. (2-tailed) value of <0.001, which is well below the significance level of 0.05. The mean difference between the two groups is 4.625, indicating that the experimental group has a significantly higher post-test score than the control group. Previously, the Levene's test for

equality of variances showed a Sig. value of 0.570 (>0.05), indicating that the variances of the two groups are homogeneous (equal variances assumed). Therefore, it can be concluded that the intervention or treatment given to the experimental group has a significant effect on improving learning outcomes compared to the control group. Based on tables 9 and 10, it can be concluded that there is an effect of the RADEC learning model based on the approach.

Based on tables 9 and 10, it can be concluded that there is an influence of the RADEC learning model based on the TPACK approach on the Improvement of Cultural Literacy for students of SMP Negeri 23 Medan and MTs. Miftahussalam Medan.

Discussion

The results of the study show that the implementation of the RADEC learning model based on the TPACK approach has a significant effect on improving students' writing skills in cultural literacy expository texts. The data reveal that students in the experimental group achieved higher posttest scores than those in the control group, confirming that the integration of technology, pedagogy, and content can make learning more meaningful and productive both academically and culturally. This interpretation is supported by the study of Damariswara and Aka (2024), which found that RADEC-TPACK-based leaflet media significantly enhanced students' basic literacy skills with a high level of effectiveness (N-gain in the "high" category) and demonstrated good practicality in student learning contexts.

The Influence of the RADEC Learning Model Based on the TPACK Approach on Improving Students' Cultural Literacy

The results of the study indicate that the implementation of the RADEC learning model based on the TPACK approach has a significant effect on improving students' cultural literacy. This is evidenced by the difference in the average posttest scores between the experimental and control groups, which shows a meaningful increase. Students who learned through the RADEC-TPACK model demonstrated better skills in writing expository texts, particularly in interpreting and relating local cultural values within the context of Indonesian language learning. This improvement signifies that the use of a learning approach integrating technology, pedagogy, and content synergistically can enrich the learning experience and strengthen students' engagement in understanding their own culture.

The RADEC model, which consists of the stages Read, Answer, Discuss, Explain, and Create, plays an essential role in developing students' critical and creative thinking processes. Through these stages, learners do not merely receive information passively but are actively engaged in reflective activities that encourage them to connect the material with their social and cultural realities. The integration of TPACK within this model provides students with opportunities to use digital media and online resources as tools for exploring local cultural values in a more contextual and engaging way. Consequently, the learning process becomes more interactive and relevant to the characteristics of today's digital generation.

The results of this study show that the experimental class using the RADEC learning model based on TPACK has a higher average posttest score compared to the control class. At SMP Negeri 23 Medan, the experimental class has an average posttest score of 87.12, while the control class only has 61.36. A similar finding was observed at MTs Miftahussalam Medan, where the experimental class had an average posttest score of 84.38, significantly higher than the control class at 61.25.

This improvement reflects the success of the RADEC learning model based on TPACK in integrating technology and active pedagogy to facilitate students' understanding of local culture. In this context, cultural literacy refers to students' ability to understand and apply local cultural values in the context of writing expository texts.

According to (Wahyudi & Setiawan, 2019), the use of the RADEC model that involves activities of reading, answering, discussing, explaining, and creating allows students to delve deeper into the material. Besides that RADEC make students actively and interactively (Fauziah, 2025). In this process, students not only study the exposition text material but also connect it with deep local cultural values.

With this approach, learning becomes more meaningful and connected to the relevant local context for students.

Students' Perception of RADEC-Based Learning with TPACK Approach in Understanding Local Culture

The second problem formulation is to determine students' perceptions of RADEC-based learning with the TPACK approach in understanding local culture. Students' perceptions of RADEC-based learning with the TPACK approach can be understood through student activity in the learning process and improvements in learning outcomes reflected in post-test data. Based on the research findings, students in the experimental class using the TPACK-based RADEC model showed higher enthusiasm and active participation in learning activities compared to students in the control class. This is in line with (Boadu & Boateng, 2024) opinion that the integration of technology in learning can enhance students' motivation, and interest to engage more in the learning process (Wekerle dkk., 2022) and facilitate teachers for their teaching process in this modern era of technology (Asad dkk., 2020).

The RADEC learning model based on TPACK also allows students to access a wider range of information, collaborate in interactive discussions (Hanum dkk., 2023), and use digital tools in composing their expository texts (Novianti dkk., 2025). According to (Yates dkk., 2021) reveal that the use of technology in learning enriches students' learning experiences, enabling them to develop digital skills (Stofkova dkk., 2022), and creativity (Tang dkk., 2022). Those are highly relevant to the challenges of education in the modern era. Students in the experimental class also expressed that they felt more challenged and engaged in learning that integrates technology and interactive activities. Based on observations during the learning process, students are more active in discussing and developing ideas related to local culture, and they feel more open to understanding the diversity of Indonesian culture.

These results indicate that the RADEC-based learning model with the TPACK approach is capable of fostering a collaborative, participatory, and student-centered learning environment. Through the use of digital technology, students are encouraged to explore local cultural information more deeply and present it in the form of meaningful expository writing. Students' active involvement in cultural discussions and reflections demonstrates that learning does not only focus on cognitive aspects but also nurtures affective awareness of the importance of preserving the nation's cultural values.

Furthermore, students' positive perceptions of the RADEC-TPACK learning model reveal that technology integration serves not merely as a supporting tool but also as a medium for character building and cultural literacy enhancement. Through the combination of reading, discussion, explanation, and creation activities, students develop critical thinking skills while simultaneously strengthening their cultural identity. These findings imply that teachers should utilize the RADEC-TPACK approach as an innovative learning strategy to foster multicultural awareness and reinforce national values amid the growing currents of globalization.

4. CONCLUSION

Implementation of the RADEC learning model based on the TPACK approach has a significant impact on increasing students' cultural literacy. The research results show a significant difference between the posttest scores in the experimental class that used the TPACK-based RADEC learning model and the control class that used conventional learning. At SMP Negeri 23 Medan, the average posttest score for students in the experimental class reached 87.12, while in the control class it was only 61.36. The same thing was found at MTs Miftahussalam Medan, with an average posttest score of the experimental class being 84.38, higher compared to the control class which only had 61.25. The RADEC learning model based on TPACK proved effective in integrating technology, pedagogy, and cultural content, allowing students to be more active and engaged in understanding local cultural values through expository texts. In addition, students' perceptions of RADEC-based learning with the TPACK approach showed higher enthusiasm, as they felt more challenged and motivated to study local culture in more depth. The use of technology in learning allows students to access broader information,

collaborate in discussions, and use digital tools in composing expository texts relevant to their real lives.

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