Munaddhomah: Jurnal Manajemen Pendidikan Islam
e-ISSN: 2775-2933
Volume 6, Issue 1, 2025, pp. 82-98

Management of Developing Interactive Multimedia-Based Arabic Teaching Materials: Enhancing Learning for Diverse Students at Indonesian Islamic Universities

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Submitted: 22-10-2024 Revised : 22-01-2025 Accepted: 10-03-2025

ABSTRACT. This study also examines the management of interactive multimedia-based Arabic language teaching development. It evaluates the effectiveness of the teaching material, which uses interactive multimedia-based, in enhancing the learning process of the Arabic language in Islamic universities in Indonesia. Given students' diverse backgrounds, interactive multimedia has proven effective in promoting engagement and independent language acquisition. Pre-test and post-test results from UIN A, UIN B, and IAIN C show significant differences between the results of the experimental group and the results of the control groups. At UIN A (t-count 16.83 > t-table 1.684), UIN B (t-count 14.278 > t-table 1.682), and IAIN C (t-count 9.34 > t-table 1.682), students in the experimental groups demonstrated substantial improvement compared to the control groups. These findings confirm that interactive multimedia effectively enhances student engagement and learning outcomes in Arabic language programs at Islamic universities in Indonesia.

Keywords: *Arabic teaching materials; Diverse students; Interactive multimedia; Student engagement; Learning outcomes.*

https://doi.org/10.31538/munaddhomah.v6i1.1469
How to Cite Muflihah, Hanifah, U., Thoha, M., & Haji Abdullah, H. R. binti. (2025). Management of Developing Interactive Multimedia-Based Arabic Teaching Materials: Enhancing Learning for Diverse Students at Indonesian Islamic Universities. *Munaddhomah: Jurnal Manajemen Pendidikan Islam*, 6(1), 82–98.

INTRODUCTION

The Arabic Language Education programs in Indonesian Islamic universities have undergone significant curriculum changes over the years. Initially, these programs were based on the Competency-Based Curriculum, which emphasized knowledge, skills, and values (Asse et al., 2023); (Rufaiqoh et al., 2024). However, a shift occurred as universities transitioned to the Indonesian National Qualification Framework (KKNI). The KKNI prioritizes practical skills and competitiveness, employing a Student-Centered Learning (SCL) model. This framework is designed to equip graduates with essential competencies such as communication skills, confidence, adaptability, and the ability to engage in collaborative problem-solving (Aziz et al., 2022) (Velasco et al., 2014), reflecting global higher education trends that emphasize transferable skills for employability (Z. Arifin et al., 2024).

In Arabic language educational context, teachers training are expected to not only acquire proficiency in linguistic and cultural knowledge but also develop leadership skills for conducting communication-focused language classes (Z. Arifin et al., 2023); (Fidayani & Ammar, 2023) (Arika, 2005). This thorough planning corresponds with the necessity to create instructional materials that embody these goals, guaranteeing that the content facilitates effective language teaching while promoting an interesting classroom atmosphere. By aligning teacher training standards with instructional resources, educators can more effectively create and implement curriculum that incorporate communicative skills and cultural significance. The teaching materials must align with the learning outcomes and incorporate digital tools that foster student engagement and autonomy (Hafner et al., 2015); (Saraswaty et al., 2024). However, these curriculum advancements have not fully addressed the challenges facing Arabic language programs in Indonesia. Several studies highlight issues such as inconsistent course outcomes (S. Arifin et al., 2023); (Firdaus & Malang, 2019); (Nadhif, 2023), the limited use of interactive multimedia in instruction (Rahma & Ismail, 2025), and the lack of standardized teaching materials (Pratama et al., 2024).

Moreover, the diverse educational backgrounds of university students present an additional layer of complexity in Arabic language instruction. Many students entering the program have limited exposure or even have not prior exposure to the Arabic language, which complicates the teaching process and requires differentiated instruction. This disparity in linguistic background often results in varying levels of language competency among students, making it difficult to implement a uniform teaching approach. Compounding these issues is the limited access to instructional technologies, which are crucial for modern language instruction but remain underutilized in many institutions (Fitrianto, 2024).

To overcome the challenges, this study emphasizes the significance of managing teaching materials using interactive multimedia-based tools for Arabic language lessons at Indonesian State Islamic universities. Tools such as Auto-Play, Wondershare Quiz Creator, and Record Arabic-Pad offer promising solutions by directly addressing key issues, including the diversity of students' learning backgrounds and the need for curriculum standardization. Auto-Play provides an interactive platform for delivering multimedia lessons that accommodate various learning styles, enabling students with different proficiencies to engage with the material effectively. Wonder share Quiz Creator allows educators to design adaptive assessments tailored to individual learning needs, promoting inclusivity and ensuring alignment with standardized learning outcomes. Similarly, Record Arabic-Pad facilitates the integration of speaking and writing practice into lessons, addressing linguistic diversity by offering personalized feedback and enhancing skill acquisition. Prior research has shown that multimedia-based learning boosts student motivation and supports language acquisition by catering to diverse learning preferences and promoting active learning (Rahman, S., 2020). By leveraging these technologies, educators can bridge the gap between diverse student backgrounds and the demands of a standardized curriculum, ensuring equitable learning opportunities and improved outcomes for all students.

METHOD

This study utilized a quasi-experimental design to assess the effectiveness of interactive multimedia-based as the teaching materials on Arabic as the foreign language learning at UIN A, UIN B, and IAIN C. A total of 240 students participated, with 80 from each institution, randomly assigned to either experimental or control groups (Latuconsina, 2023); (Djamas et al., 2018); (Nisa, 2024). The participants had diverse educational backgrounds: 22.6% were from public high schools, 46.4% from Islamic schools, and 28.6% from pesantren. An additional 2.4% of students came from other backgrounds, specifically vocational high schools (SMK Negeri) and modern Islamic boarding schools (Pondok Modern), which were not explicitly categorized in the primary groupings.

Research indicates that students from public high schools typically have limited exposure to Arabic, whereas those from Islamic schools and pesantren often possess a stronger foundation, particularly in classical Arabic texts (Adriani, 2018); (A. K. Azizah et al., 2024). This diversity in prior knowledge affects language acquisition and influences how students adapt to different instructional methods (Djamas et al., 2018); (Kusumaningrum & Syahrial, 2018). The main objective of this study was to evaluate whether multimedia-based materials could help bridge these proficiency gaps, with the hypothesis that students from less Arabic-intensive backgrounds would experience greater benefits from multimedia interventions (Prihartini et al., 2021); (I. Azizah & Mardiana, 2024); (Huda et al., 2024); (Rahma & Ismail, 2025).

Materials: The interactive multimedia tools incorporated learning themes designed to enhance language proficiency through targeted exercises that developed students' speaking skill, listening skill, reading skill and writing skill. The multimedia contents included pictures, audio, text, and recordings, utilizing tools such as the Arabic-Pad tool for language input and interactive features like Wondershare Quiz Creator and AutoPlay for real-time feedback. These materials, comprising quizzes and language games, were designed to increase engagement and provide immediate corrective feedback, fostering active learning and skill development (Aprianto et al., 2020); (Rafida et al., 2024); (Safrilsyah et al., 2024); (Rahma & Ismail, 2025). Prior research indicates that interactive multimedia significantly enhances learner engagement and retention (Djamas et al., 2018); (Huang & Mayer, 2016).

Procedure: The study was executed across a single semester. At the semester's commencement, both the experimental and control groups undertook a pre-test to assess their starting ability in Arabic. During the semester, the experimental groups employed interactive multimedia resources, such as quizzes, audio-visual aids, and adaptive learning tools, in classroom sessions. Conversely, the control groups received instruction through conventional lecture-based techniques, predominantly consisting of teacher-led expositions presented via PowerPoint, devoid of multimedia interactivity (Tuhuteru et al., 2023); (Zamroni & Supriyanto, 2024).

The duration of each learning session was identical for both the experimental and control groups to maintain consistency in instructional time. Each session lasted 90 minutes and encompassed activities including vocabulary enhancement, grammar teaching, and reading comprehension challenges. In the control group, the instructor exclusively utilised verbal explanations and static visual aids in PowerPoint slides to provide the lesson, while students engaged passively with minimal engagement.

At the conclusion of the semester, a post-test was conducted for all participants to evaluate their progress and determine enhancements in Arabic language proficiency. The pre-test and post-test results were compared to assess the efficacy of interactive multimedia resources in improving language acquisition relative to traditional lecture-based methods.

Data Analysis: The process of data analysis was conducted by the use of paired sample t-tests to get the differences of the finding both pre-test and post-test between the experimental and control groups. The experimental groups demonstrated significant improvements, with t-count values for UIN (Djamas et al., 2018) A (16.83), UIN B (14.278), and IAIN C (9.34) all exceeding the critical t-table value of 1.684, indicating statistically significant differences in learning outcomes (Riaji et al., 2022); (Okoye & Hosseini, 2024); (Hackl, 2021). Statistical analysis was conducted using SPSS version 16, focusing on assessing whether multimedia-based teaching materials contributed to improved learning outcomes (Almarshedi, 2022); (Abdelrasheed et al., 2020); (Nasution et al., 2024).

Hypotheses:

H0: There were no significant variations in learning outcomes among students using interactive multimedia-based teaching materials and those receiving traditional lecture-based instruction (Huang & Mayer, 2016).

Ha: Significant were differences exist on the students' learning outcomes of students using interactive multimedia-based teaching materials, with positive impacts on student engagement and performance (Rahma & Ismail, 2025); (Djamas et al., 2018).

RESULT AND DISCUSSION

Result

To systematically oversee the development of interactive multimedia Arabic language teaching tools, it is crucial to implement an organized framework. This research utilizes the POAC model (Planning, Organizing, Actuating, and Controlling) as a foundational framework in the development process. The planning phase concentrated on establishing objectives and performing a requirements analysis to improve students' Arabic proficiency using engaging and interactive resources. This entailed recognizing students' linguistic difficulties, assessing technological accessibility, and formulating a comprehensive plan delineating resource needs, developmental phases, and multimedia instruments such as interactive quizzes and video lessons.

The organization involved the assembly of a team of content developers, instructional designers, and multimedia specialists. Tasks were efficiently split and coordinated, while resources were managed to guarantee seamless execution. Software tools such as Auto-Play and Wonder share Quiz Creator were acquired, and all stakeholders were equipped with the requisite technology. The implementation phase encompassed executing the designated actions, which included facilitating training sessions for educators on multimedia tools, developing prototypes of instructional materials, and evaluating them with small student groups to collect feedback. Workshops and seminars were conducted to tackle difficulties and enhance the materials.

During the controlling phase, the created materials underwent evaluation and refinement via pilot testing, assessing students' engagement and learning outcomes. Input from students and instructors were utilized to implement iterative enhancements, guaranteeing conformity with the objectives established throughout the design phase. The procedure also encompassed recording advancements and offering suggestions for ongoing improvement. This study systematically applied the POAC framework, integrating theoretical management concepts with practical implementation, yielding high-quality, and interactive teaching materials that efficiently cater to students' different learning needs and improve their Arabic language skills.

The following presents the finding of the study on the Management of Developing Multimedia-Based for teaching Arabic that involve students' to be interactive through the use of teaching materials in Arabic language learning at three Islamic universities in Indonesia: UIN A, UIN B, and IAIN C.

Management of Interactive Multimedia-Based Teaching Materials at UIN A

Research findings indicate that backgrounds of students in term of education in the Arabic Language Education program at UIN A are varied significantly. The respondents were categorized into three groups: students from Islamic boarding schools, public schools, and Islamic-based schools. Specifically, the 22.6% of the students came from general high schools/MA, 46.4% from Islamic-based high schools or vocational schools, and 28.6% from Islamic boarding schools. These results suggest that a substantial portion of students (22.6%) have a general education background, highlighting the need for engaging and effective teaching materials to support their learning of Arabic (Ritonga et al., 2024); (Ramamneh & Yzhia, 2023); (Adriani, 2018).

The implementation of interactive multimedia-based that involves interactivity of students' for teaching Arabic materials at UIN A focused on students in the Arabic Language Education Program at the Tarbiyah faculty, particularly in the 'Istima 'wa Kalam lil Mubtadi`in' course. Class C was designated as the experimental group, while another class, D class was assisted to be the control group. This research procedure began with a pre-test directed to both clutches. Following this, multimedia materials were distributed, and the researcher selected the relevant themes and language skills to be developed. Students in the experimental group engaged with the interactive multimedia materials and completed related exercises. Afterward, they presented their work, which was subsequently reviewed and corrected using the multimedia tools. Finally, a final test at the last or called as post-test was directed to measure the effectiveness of the multimedia-based teaching approach (Djamas et al., 2018); (A. K. Azizah et al., 2024).

The results showed weighty changes on the students' learning outcomes in the treatment class before and after implementing the multimedia-based materials. The results of paired sample T-test for both pre- and post-test can be shown through the table below:

Table 1: Paired T for Pre-Test - Post-Test Of Experimental Class UIN A

	N	Mean	Standard Deviation	Standard Error Mean
Pre-Test	42	86.17	2.836	0.438
Post-Test	42	91.95	2.527	0.390
Difference	42	-5.786	2.247	0.347

95% CI for mean difference: (-6,486; -5,085), T-Test of mean difference = 0.05 (vs not = 0.05): T-Value = -16,83, P-Value = 0.000

Table 2: Paired Sample Test Of Experimental Class UIN A

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Before using interactive CD-based teaching materials-after using interactive CD-based teaching materials	-5.786	2.247	.347	-6.486	-5.085	-16.685	41	.000

According to the result of the paired sample T-test deviousness expending SPSS 16, the value of t-count for both pre and post-test was 16.83, which is better and higher than the value on the t-table 1.684. This indicates that the interactive multimedia-based teaching materials significantly improved the students' learning outcomes compared to the students' in experimental class.

$T\text{-}_{tabel} = t_{tabel}$:db

Db = n-1

Db = 42-1

Db = 41

$t\text{-}_{table} = t_{0,05} : 41 = 1.684$

[So $t\text{-}_{count}$ (16.83)> $t\text{-}_{table}$ (1,684), so Ha is accepted and H0 is rejected

In contrast, the control class, which did not use interactive multimedia, showed no significant differences in learning outcomes before and after the intervention(Jagdev et al., 2010).

The finding of the paired sample t-test: both pre and post-test was determined by means of SPSS 16, the findings are presented on the table as follows:

Table 3: Paired T For Pre-Test - Post-Test Control Class UIN A

	N	Mean	Standard Deviation	Standard Error Mean
Pre-Test	41	84.780	3.298	0.515
Post-Test	41	87.098	2.862	0.447
Difference	41	-2.317	1.619	0.253

95% CI for mean difference : (-2,828; -1,806), T-Test of mean difference = 0.05 (vs not = 0.05): T-Value = -9.44, P-Value = 0.000

The t-count for the control class was 9.44, which is also higher than the t-table value, though the improvement was smaller compared to the treatment class. These findings suggest that students in the treatment class, who used interactive multimedia-based materials, achieved better outcomes compared to the students who are on the control class, who did not (Ritonga et al., 2024).

Table 4: Paired Sample Test Of Control Class Class UIN A

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1 Before using interactive CD-based teaching materials-after using interactive CD-based teaching materials	-2.333	1.603	.247	-2.833	-1.834	-9.434	41	.000

Based on the results of calculation accomplished by expending the SPSS 16 tender it can be understood that the rate of the t-count from both pre and post-test stands is 9.44. The calculation of T-table is showed below:

$T_{tabel} = t_{table}$: db

Db = n-1

Db = 41-1

Db = 40

$t_{tabel} = t_{0,05} : 41 = 1.684$

So tcount (9.44)> ttable (1,684), so Ha is accepted and H0 is rejected.

The data analysis of pre-test and post-test results between the experimental and control classes clearly demonstrates the effectiveness of multimedia-based which involves interactivity for students through its used in teaching materials at UIN A. The significant differences in performance are reflected on the results of the t-test. The treatment class reported a t-count of 16.83, which exceeds the t-table value of 1.684 in both the pre and post-test. Similarly, the control class have displayed a t-count of 9.44, also exceeding the t-table with value of 1.684. Those findings suggest students who engaged with interactive multimedia-based materials achieved significantly better learning results associated to those students in the control class who did not utilize these resources. This highlights the role of multimedia in enhancing Arabic language learning outcomes.

Management of Interactive/Cooperative Multimedia-Based Teaching Materials at UIN B

These research findings indicate that the backgrounds of students' educations in the Arabic Language Teaching/ Learning program at UIN B are diverse. The respondents can be categorized into three groups: those from Islamic boarding schools, public schools, and Islamic-based schools. Specifically, 35.7% of the students come from general high schools/MA, 21.4% from Islamic-based high schools or vocational schools, and 42.9% have an Islamic boarding school background. These results suggest that a significant portion of UIN B's Arabic Language Education students have a general-based educational background, highlighting the need for engaging and effective teaching materials to support their Arabic language learning (Ritonga et al., 2024); (Ramamneh & Yzhia, 2023); (A. K. Azizah et al., 2024).

In the implementation of cooperative multimedia-based for teaching Arabic materials at UIN B, the study was conducted during the first semester, with Class A serving as the experimental group and Class B as the control group. The research began with a pre-test directed to both classes to assess the students' primary competencies. Following the pre-test, the multimedia materials were distributed, and relevant themes and language skills were selected. Students in the experimental class engaged with the interactive multimedia materials and completed exercises based on the content. Upon completion of the exercises, students presented their work, receiving feedback from both the lecturer and their peers using the multimedia tools. Finally, a post-test was administered to evaluate the effectiveness of the multimedia-based instruction (Liu et al., 2022); (Djamas et al., 2018).

The results show noteworthy changes of students' learning outcomes in the treatment class before and after implementing interactive multimedia-based teaching materials. The finding of paired sample t-test from the experimental class is presented below:

Table 5: Paired T for Pre- and Post-Test of Experimental Class UIN B

	N	Mean	Deviation Standard	Standard Error Mean
Pre-Test	43	23.02	22.471	22.471
Post-Test	43	47.74	18.057	18.057
Difference	43	-18.721	8.598	8.598

95% CI for mean difference: (-21.367; -16.075), T-Test of callous change = 0.05 (vs not = 0.05): T-Value = -14.278, p-Value = 0.000

Table 6: Paired Sample Test Of Control Class Class UIN B

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1Before using interactive CD-based teaching materials-after using interactive CD-based teaching materials	-18.721	8.598	1.311	-21.367	-16.075	-14.278	42	.000

Based on the paired sample t-test calculation using SPSS 16, the t-count rate for the pre and post-test in the experimental class was 14.278, which is grander compared to the t-table of value of 1.682. This shows that interactive multimedia-based teaching materials significantly improved the students' learning- outcomes in treatment class.

$T_{table} = t_{table} : db$

Db = n-1

Db = 44-1

Db = 43

$t_{tabel} = t_{0,05} : 43 = 1.682$

[So t_{count} (14,278)> t_{table} (1,682), so Ha is accepted and H0 is rejected

So, there are significant differences in the learning outcomes of Arabic students before and after implementing Arabic cooperative teaching materials.

In contrast, the control class, which did not use interactive multimedia, showed no significant improvement. The paired sample t-test outcomes for the control class are presented below: The outcome of the sample t-test: pre and post-test are determined by means of SPSS 16, the outcomes of which are unfilled in tabular bellow:

Table 7: Paired T for Pre and Post-Test of Control Class UIN B

	N	Mean	Deviation Standard	Standard Eror Mean
Pre-Test	43	25.12	25.248	3.850
Post-Test	43	82.19	20.217	3.083
Difference	43	-57.070	30.278	4.617

95% CI for mean difference: (-66,388; -12,360), T-Test of mean variance = 0.05 (vs not = 0.05): T-Value = -12.360 , P-Value = 0.000

Although the t-count value for the control class was 12.360, which is also greater than the t-table value, the improvement was smaller compared to the experimental class. This suggests that students in the experimental group who used interactive multimedia achieved better learning result rather than to those students of control group (Ritonga et al., 2024).

Table 8: Paired Sample Test Of Control Class Class UIN B

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Before using interactive CD-based teaching materials-after using interactive CD-based teaching materials	-57.070	30.278	4.617	-66.388	-47.752	-12.360	42	.000

According to the finding of calculation accomplished by means of the SPSS 16 use it can be perceived that the rate of the t-counts from the pre and post-test boards is 14,278. The calculation of t-table is:

$T_{table} = t_{table}$:db

Db = n-1

Db = 43-1

Db = 42

$t_{tabel} = t_{0,05} : 42 = 1.682$

So tcount (12.36.)> Ttable (1,682), so Ha is accepted and H0 is rejected.

Based on the calculation of the data above (the pre-test and post-test results between the treatment and controller classes), it can be concluded that implementation **of results of the development** of cooperative material based multimedia for teaching at UIN B was effective. The significant differences between the experimental and control classes are evident from the t-count and t-table results. In the experimental class, the t-count rate (14.278) is grander rather than the t-table rate (1.682) for both the pre and post-test. Similarly, in the control class, the t-count rate (12.36) is also bigger rather than the t-table rate (1.682). These results indicate that students who studied using interactive multimedia achieved better learning outcomes compared to those who did not use interactive multimedia.

Management of Interactive/Cooperative Multimedia-Based Teaching Materials at IAIN C

This research findings show that backgrounds of students' educations in the Arabic Language Teaching/ Learning program at IAIN C are diverse. The respondents can be categorized into three groups: students from Islamic boarding schools, public schools, and Islamic-based schools. Specifically, 39.7% of the students come from general high schools/MA, 35.3% from Islamic-based high schools or vocational schools, and 25% from Islamic boarding schools. These results highlight that a significant portion of Arabic Language Education students at IAIN C have a general education background, emphasizing the need for engaging teaching materials to effectively support Arabic language learning (Ritonga et al., 2024); (Ramamneh & Yzhia, 2023); (A. K. Azizah et al., 2024).

In the implementation of the results of the improvement of interactive/cooperative multimedia based materials at IAIN C, the research was conducted during the first semester, with A Class elected as the treatment group and B Class as the controller group. Initially, a pretest was managed to both two clutches to assess the students' primary competencies. Following the pre-

test, multimedia materials were distributed, and the researcher selected relevant themes and language skills. Students in the experimental group engaged with the interactive multimedia materials and participated in exercises based on the content. After completing the exercises, students presented their work, which was reviewed and corrected using the multimedia tools. Finally, a post-test was directed to gauge the efficacy of the multimedia-based instruction (Djamas et al., 2018) (Yusuf & Arif, 2022).

The results show momentous variances students' outcomes of learning in treatment class before and after implementing interactive multimedia-based teaching materials. The paired sample t-test outcomes for experimental class are shown below:

Table 9: Paired T for Pre and Post-Test of Experimental Class IAIN C

	N	Mean	Deviation Standard	Standard Eror Mean
Pre-Test	42	84.83	3.275	0.515
Post-Test	42	87.17	2.862	0.442
Difference	42	-2.333	1.603	0.247

95% CI for mean variance: (-2,833; -1,834), T-Test of callous variance = 0.05 (vs not = 0.05): T-Value = -9.434 , P-Value = 0.000

Based on the paired t-test calculation using SPSS 16, the t-count rate for the pre and post-test in the experimental class was 9.34, which is better rather than the t-table rate of 1.684. This shows that interactive multimedia-based teaching materials significantly improved the students' outcomes of learning in the treatment class.

$T_{tabel} = t_{tabel} : db$

Db = n-1

Db = 42-1

Db = 41

$t_{tabel} = t_{0,05} : 41 = 1.684$

so t_{count}

(9.34)> t_{table} (1,684), so Ha is accepted and H0 is rejected.

So, there are significant differences in the learning outcomes of Arabic students before and after implementing Arabic material of teaching..

Table 10: Paired T for Pre and Post-Test of Control Class IAIN C

	N	Mean	Deviation Standard	Standard Eror Mean
Pre-Test	24	55.42	28.663	5.851
Post-Test	24	81.50	21.655	4.420
Difference	24	-26.083	17.095	3.490

95% CI for mean difference: (-33.302; -18.865), T-Test of mean variance = 0.05 (vs not = 0.05): T-Value = -7.475, P-Value = 0.000

Table 11: Paired Sample Test Of Control Class Class IAIN C

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1Before using interactive CD-based teaching materials-after using interactive CD-based teaching materials	-26.083	17.095	3.490	-33.302	-18.865	-7.475	23	.000

While the t-count value for the control class was 7.475, which is grander than the t-table rate of 1.713, the improvement was significantly less compared to the experimental class. These findings suggest that students in the experimental class who studied using interactive multimedia achieved better learning outcomes compared to those in the control class (Ritonga et al., 2024).

Ttable = ttable:db

Db = n-1

Db = 24-1

Db = 23

ttable = t0,05 : 23 = 1.713

So t-count (7,475) > ttable (1,713), means Ha is accepted and H0 is rejected.

Based on the calculation of the data above (the pre-test and post-test results between the treatment and controller classes), it can be concluded that implementation of the results of the enlargement of interactive/ cooperative multimedia-based materials of teaching at IAIN C was effective. The significant differences between the experimental and controller classes are evident from the t-count and t-table outcomes. The experimental class shows a t-count rate of 9.34, which is superior than the t-table rate of 1.684 for both the pre-test and post-test. Similarly, in the control class, the t-count rate of 7.475 is better than the t-table value of 1.713. These outcomes point out students who studied using interactive multimedia achieved better learning outcomes compared to those who did not use interactive multimedia

The similarities of the research results among the three universities

The findings from UIN A, UIN B, and IAIN C reveal that students from public schools with limited Arabic exposure exhibited lower proficiency levels, particularly at IAIN C (Bărbuleț, 2023); (Almelhes, 2024); (Wandana et al., 2025). However, varied rates of progress were observed during the use of interactive multimedia tools. Students at IAIN C, due to their lower initial proficiency, required more repetition and time to grasp the material, whereas UIN B students improved at a faster rate, although they still needed support in grammar application (Kusumaningrum & Syahrial, 2018); (Prihartini et al., 2021). UIN A students, having a stronger foundation in Arabic, advanced the most quickly with minimal difficulties (Brett, 1997); (Djamas et al., 2018).

These results are consistent with prior research indicating that students with a stronger academic background benefit more rapidly from multimedia tools (Liu et al., 2022); (Mahdi et al., 2024). The use of interactive multimedia successfully bridged proficiency gaps, enhancing both student engagement and learning outcomes, particularly for students with limited prior exposure

to Arabic (Mustadi et al., 2024); (Zaim, 2016). This underscores the effectiveness of multimedia in addressing the diverse needs of learners in language acquisition (Shofi, 2020); (Almelhes, 2024).

Discussion

The effects of development management, evidenced by the use of interactive and collaborative multimedia resources for instruction, have demonstrably improved Arabic language learning results in Indonesian Islamic universities. Research at UIN A, UIN B, and IAIN C shown that students in experimental groups employing multimedia resources regularly surpassed their counterparts in control groups, validating earlier studies (Wondim et al., 2024); (Almohesh & Altamimi, 2024). The incorporation of interactive quizzes, audio-visual components, and adaptive learning instruments significantly enhanced understanding and retention. Quizzes offered prompt feedback, reinforcing essential concepts and enabling pupils to pinpoint areas of deficiency. Audio-visual components, including films and animations, accommodated various learning styles by providing visual and audio reinforcement, so enhancing the accessibility of intricate linguistic systems. Adaptive learning technologies enhanced the personalization of the educational experience, allowing students with minimal exposure to Arabic to more effectively align with their peers (Keumalawati & Hossam, 2020); (Ead, 2025).

Statistical analysis validated these improvements. At UIN A, the t-count value of 16.83 demonstrated a substantial enhancement in learning outcomes for the experimental group, resulting from the incorporation of multimedia that addressed core deficiencies in vocabulary and grammar. Correspondingly, UIN B's t-count value of 14.278 underscored the efficacy of interactive components in enhancing sentence formation and conversational abilities. At IAIN C, the t-count value of 9.34, while lower than the others, still indicated significant advancement, especially in the understanding of ancient Arabic texts. The results together confirm the premise that multimedia-based teaching materials bridge proficiency gaps and improve learning outcomes (Tuhuteru et al., 2023); (Khoiriah et al., 2016); (Aziz et al., 2022).This study highlights the transformative potential of technology-enhanced teaching in Arabic language education by directly correlating statistical improvements with specific elements of multimedia integration, thereby ensuring a more engaging and effective learning experience for students with diverse levels of prior knowledge.

The versatility of multimedia promotes self-directed learning, thereby augmenting learner autonomy and elevating motivation to interact thoroughly with the content (Wu et al., 2024) (Lee & Chang, 2024). This corresponds with (Alafnan, 2025) motivational tactics, highlighting the significance of autonomy in maintaining engagement. Platforms like Auto-Play and Wondershare Quiz Creator enable students to advance at their own pace, providing instantaneous feedback that enhances learning and fosters confidence. Furthermore, interactive multimedia alleviates learning anxiety by creating a low-pressure atmosphere that allows students to play with language, thereby improving their confidence and overall language acquisition (Hajiyeva, 2024).

In addition to enhancing motivation and confidence, multimedia facilitates metalinguistic awareness, allowing students to internalise intricate linguistic structures and refine their proficiency in Arabic grammar and vocabulary. Dynamic visualizations and adaptive exercises increase learners' comprehension of syntax and morphological patterns, which are crucial in Arabic (Villarreal, 2023). Moreover, collaborative tools integrated within multimedia platforms, including discussion forums and group projects, improve communication skills and offer opportunities for genuine language practice, essential for second language acquisition (Dia, 2024).

Although multimedia presents distinct benefits, its deployment also entails hurdles, including the necessity for dependable technological infrastructure and sufficient training for educators (Hanifah et al., 2024). Ensuring fair access to multimedia technologies at under-resourced institutions constitutes a substantial obstacle, and technological challenges might impede the learning process (Ambar et al., 2024); (Fernandez, 2022). Nonetheless, these

problems can be alleviated via institutional support, professional development for educators, and meticulous planning (Annisa et al., 2020) (S. Arifin et al., 2023) (Arifmiboy et al., 2024).

These findings highlight the pivotal importance of multimedia in establishing interactive and dynamic learning environments. Multimedia improves performance, engagement, and long-term learning outcomes in Arabic language programs by targeting motivational, cognitive, and social aspects of language acquisition (Alobaid, 2020). Therefore, the incorporation of interactive multimedia is essential for enhancing Arabic language instruction in various academic environments.

CONCLUSION

The findings affirm the significance of regulating the expansion of Interactive/Cooperative Multimedia-Based materials for Arabic instruction in markedly improving Arabic language learning results. In the Management of Interactive Multimedia-Based Teaching Materials within the Arabic Teaching and Learning Programs at UIN A, UIN B, and IAIN C, students in experimental groups regularly surpassed their counterparts in control groups, as demonstrated by the t-test results. The t-values for UIN A (16.83), UIN B (14.278), and IAIN C (9.34) surpassed their corresponding t-table values, signifying statistically significant enhancements in learning outcomes. These findings highlight the pivotal importance of interactive multimedia in enhancing student performance, rendering it an indispensable resource in Arabic language education. Its implementation can effectively address proficiency disparities and improve the educational experience for students in various circumstances inside Indonesian Islamic universities. Enhancing the utilization of interactive multimedia in Arabic instruction necessitates comprehensive training for educators on technology integration and the establishment of a robust technological infrastructure at Islamic universities, guaranteeing access to multimedia resources and digital learning platforms. Subsequent research should concentrate on modifying this approach to accommodate diverse Islamic colleges, particularly those with limited resources. Furthermore, study ought to investigate the effect of interactive multimedia on essential language competencies, including speaking and writing, and evaluate its enduring impact on graduation results. Policymakers must formulate measures that ensure equitable access to interactive multimedia, thereby improving the quality of Arabic language education in Indonesia and optimizing the administration of multimedia-based instructional resources.

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