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Transformation of Verbal Skills Through the Station Rotation Learning Model: A Quantitative Analysis of Students' Verbal Fluency.

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Abstract

This study aims to examine the effectiveness of the Station Rotation Blended Learning Model in improving the maharat al-kalam (Arabic speaking skills) of 10th-grade students at MA Plus Keterampilan Hasyim Asy'ari Tegaldelimo. This study is a quasi-experimental study using a non-equivalent control group pretest-posttest design. A total of 60 10th-grade students were divided into two groups: the experimental group (n=30), which received instruction through four rotating stations (Teacher, Multimedia, Collaboration, and Creativity), and the control group (n=30), which received conventional instruction. The speaking test instrument was based on ACTFL standards. Quantitative data were analyzed using a paired-sample t-test, Cohen's d effect size, and N-Gain. Thematic analysis of observation notes and interviews revealed increased self-confidence and reduced speaking anxiety in the experimental group. The Rotating Station Blended Learning Model proved to be effective and statistically significant in improving Arabic speaking skills. This model offers a creative solution to address low oral production skills in foreign language learning.

1. Introduction

Speaking skills (maharah al-kalam) are often considered both the most important and the weakest aspect of Arabic language learning in Indonesia. The grammar-translation method (qawaid wa tarjamah) still dominates, with an emphasis on memorization but a neglect of contextual communication. As a result, students can read texts but stutter and lack confidence (al-tawahhur al-lughawi) when speaking even simple sentences.

This inability to speak poses a serious obstacle, given that Arabic is the primary language for access to education, the economy, and religious practices. A study (Selim, 2023) indicates that a lack of practice causes students in non-Arabic-speaking countries to struggle with oral production. (Alenezi & Mugaddam, 2023) also found that speaking anxiety is a primary psychological factor hindering student participation. This research proposes a more interactive and practical learning model to address these socio-educational issues.

Previous research has shown that blended learning can enhance student engagement and autonomy (Hafiz et.al, 2025). Meanwhile, the station rotation model facilitates differentiated and collaborative learning (Yılmaz & Açıkgül Fırat, 2024).Combining the two has the potential to create a learning environment that is both adaptive and structured. However, these two lines of research continue to run parallel. As noted by (Sun, 2023), research on integrating the two has focused more on overall language proficiency rather than the ability to speak correctly. Station rotation research has also been used more frequently in science and mathematics. According to a systematic review conducted by (Katasila & Poonpon, 2022), there is little research examining rotation models in foreign language learning, particularly oral skills. Therefore, there is a clear gap in the literature that this study aims to address by examining how the combination of blended learning and station rotation impacts the improvement of Arabic speaking skills.

The "Enclosed Station Rotation Model," the innovation of this research, is designed to address specific weaknesses in the teaching of maharah al-kalam by utilizing strategic technology across various stations. The first innovation is a station configuration dedicated to teaching various aspects of speaking. This configuration includes a pronunciation station (makharij al-huruf) that uses an online application providing instant feedback, a structured conversation station (muwajjah) with a teacher, and a free conversation simulation station (hurr) that uses video prompts. The second innovation stems from a broader approach.

This approach not only measures outcomes (products) but also focuses on how to enhance self-confidence and reduce speaking anxiety during the rotation (Basith dkk., 2025). Findings (Resti dkk., 2024) regarding activity variations and recommendations on the use of digital tools served as inspiration for this method. Therefore, the novelty of the research lies in "how" to organize the learning experience. This concept describes an approach/perspective (paradigm) that uses digital technology to create learning experiences that are adaptive (differentiated) and promote collaboration.

Although the station rotation model is effective in science and mathematics education, its application in foreign language learning particularly in developing speaking skills remains limited. A systematic review (Katasila & Poonpon, 2022) confirms the scarcity of research on the rotation model for foreign language speaking skills. Furthermore, existing research focuses more on general language proficiency than on speaking skills specifically (Sun, 2023).

This study proposes a Closed-Station Rotation Model with three innovations:

1. Station-specific configurations: a pronunciation station (makharij al-huruf) with instant digital feedback, a structured conversation station with a teacher, and a video-based free conversation simulation station.
2. Focus on affective aspects: measuring not only learning outcomes but also confidence and speaking anxiety during the rotation process.
3. Adaptive-collaborative approach: using digital technology to create a learning experience that adapts to students' abilities while fostering collaboration.

The primary objective of this study is to examine how the implementation of the Station Rotation Learning Model impacts the improvement of students' Arabic speaking skills. The effects of implementing this model are measured using factors such as fluency, accuracy, vocabulary, and self-confidence. This study aims to answer fundamental questions regarding the effectiveness of this innovative model in Arabic classroom practice, with a particular emphasis on improving the quality of oral output as an indicator of learning success.

By establishing clear and measurable objectives, this research will provide clear empirical data on the extent to which this model can address significant social issues. This objective aligns with the call (Fayyoumi dkk., 2024) for the importance of experimenting with active learning models to address low Arabic language productive skills. On the other hand, (Serrano-Ausejo & Mårell-Olsson, 2024) Overall, the objective of this study is to test the hypothesis that the station rotation model is an effective solution for improving students' speaking skills. This implies that, both theoretically and practically, the model makes a significant contribution to enhancing the quality of Arabic language learning.

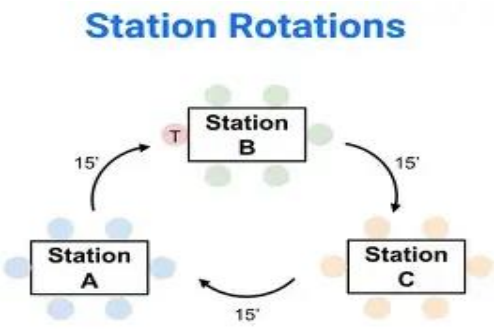
The Station Rotation Model is significantly more effective at improving Arabic speaking skills than conventional methods. This hypothesis is based on the logic that this model maximizes the time students spend speaking both individually and in groups. The model is designed so that all students—whether shy or outgoing—have equal opportunities to practice. The variety of structured activities at each station is expected to reduce anxiety, increase intrinsic motivation, and provide a safe environment for experimentation. This is supported by cognitive load theory (Chen et al., 2023), which explains how structured task division helps students process language information more efficiently. There is empirical support for the findings (Fitriani & Suriansyah, 2025) that station rotation increases student participation.

2. Method

The aim of this experimental study is to measure the effectiveness of the Station Rotation Blended Learning Model in improving Arabic speaking skills (maharah al-kalam). This study employs a quasi-experimental design using a non-equivalent control group pretest-posttest design.

Sampling Procedure: A sample of 60 students was purposively selected from the Year 10 cohort based on the following criteria: (1) they had not previously received station rotation-based instruction, (2) they possessed a relatively homogeneous initial level of Arabic proficiency based on their previous semester's examination results, and (3) they were willing to participate fully in eight sessions. Two naturally formed classes were then designated as the experimental group (n=30) and the control group (n=30) without individual randomisation.

The intervention was carried out over eight consecutive weeks, with one session per week. Each session lasted 80 minutes. In the experimental group, the session was divided into four rotating stations, each lasting 20 minutes. The control group received traditional instruction of the same duration (80 minutes per session) without station rotation.



Adaptation of the ACTFL Rubric for Arabic: The speaking assessment rubric, adapted from the ACTFL (American Council on the Teaching of Foreign Languages) standards, has been specifically modified for the Arabic language context, taking into account the phonological and morphological characteristics of Arabic. The four aspects assessed include:

1. Pronunciation: Focuses on the accuracy of pronunciation of distinctive Arabic phonemes such as ق, ح, غ, ع, as well as vowel length.
2. Grammatical Accuracy: Covers gender agreement (masculine/feminine), verb forms based on tense, and the use of basic 'irab (final vowel marks).
3. Fluency: Measures the ability to speak without long pauses and without the dominance of the native language.
4. Vocabulary Range: Assessed based on the variety and accuracy of thematic vocabulary usage.

Each aspect is assessed on a scale of 1–5, with a maximum total score of 20 points. This rubric has undergone content validity testing by two experts (an Arabic lecturer and a senior teacher), yielding a Content Validity Index (CVI) of 0.89 (high category).

The speaking test instruments (pre-test and post-test) use a set of questions of equivalent difficulty that has been balanced through pilot testing on 30 students outside the sample. Inter-rater reliability was calculated using Cohen's Kappa with two independent raters (an Arabic language teacher and a researcher). The test results showed a value of $\kappa = 0.84$. Furthermore, a test-retest procedure conducted two weeks apart on a small group yielded a correlation coefficient of 0.87, indicating good temporal stability.

Data Analysis: This study employed a concurrent mixed-methods approach (Proudfoot, 2023). Quantitatively, the data were analysed using: prerequisite tests: Shapiro-Wilk (normality) and Levene (homogeneity of variance); hypothesis tests: paired-sample t-test (comparison of pre-test and post-test within groups) and independent-sample t-test (comparison between groups); calculation of Cohen's d effect size with interpretation, as well as N-Gain to measure relative effectiveness. Qualitatively, data from the model implementation observation sheets and semi-structured interviews with 10 students per group were analysed using Braun & Clarke's six-phase thematic analysis (Christou, 2022). The quantitative and qualitative results were then integratively

triangulated to obtain a holistic understanding of the model's effectiveness (Widodo dkk., 2024).

3. Result

Implications of the Descriptive Findings for the Effectiveness of the Station Rotation Model

Tabel 1.1 *Table 1.1 Characteristics of Baseline and Final Data for Both Study Groups*

Descriptive Statistics						
	N	Range	Minimum	Maximum	Mean	Std. Deviation
Pretes experiment	30	26	42	68	54.97	6.066
postest experiment	30	22	78	100	88.80	6.488
pretest control	30	38	42	80	63.67	7.517
postest control	30	29	60	89	71.70	6.939
Valid N (listwise)	30					

The experimental group (Station Rotation Model) showed an average increase of 33.83 points (from 54.97 to 88.80). In contrast, the control group (Conventional Learning) increased by only 8.03 points (from 63.67 to 71.70).

Although the experimental group's pretest average was lower than the control group's (54.97 < 63.67), its posttest average actually surpassed the control group by 25.80 points. Furthermore, only in the experimental group were there students who achieved a perfect score (100), indicating a greater potential for mastery of the material.

Summary of Improvement:

- Experimental: +33.83 points
- Control: +8.03 points

This significant difference in improvement provides descriptive support for the effectiveness of the station rotation model in enhancing Arabic speaking skills, prior to proceeding to inferential testing.

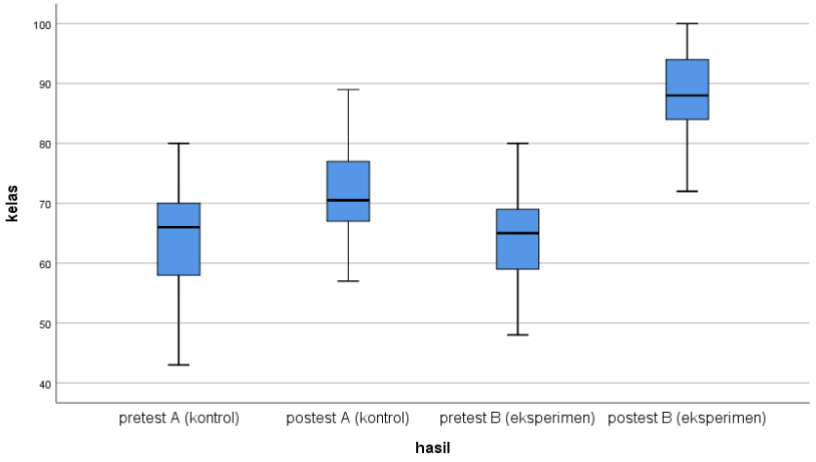


Figure 1.1: Descriptive graph of the variable

Validity of Statistical Analysis Based on the Results of the Normality Test

Table 1.2 Results of the Normality Assumption Test for Parametric Analysis

Tests of Normality				
		Shapiro-Wilk		
	Class	Statistic	df	Sig.
Result	pretest A (experiment)	.945	30	.123
	postest A (experiment)	.949	30	.154
	pretest B (control)	.964	30	.387
	postest B (control)	.970	30	.536

All significance values (Sig.) in the Shapiro-Wilk test were > 0.05, so all four data groups were deemed to be normally distributed.

The Shapiro-Wilk statistic values ranged from 0.945 to 0.970 (close to 1), indicating a highly ideal data distribution. With the assumption of normality met, parametric tests (paired-sample t-test and independent-sample t-test) can be used for further inferential analysis.

Validity of Comparative Tests Based on the Fulfilment of the Homogeneity Assumption

All significance values (Sig.) in Levene's test were greater than 0.05, indicating that the variances of the data between the two groups were homogeneous.

Table 1.3 Results of the Homogeneity Assumption Test for Parametric Analysis

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig.
Result	Based on Mean	.010	1	58	.921
	Based on Median	.010	1	58	.920
	Based on Median and with adjusted df	.010	1	55.875	.920
	Based on trimmed mean	.009	1	58	.927

The very small Levene's statistic values (0.009–0.010) and p-values close to 1.000 indicate that there is virtually no difference in variance between groups. With the assumptions of normality and homogeneity met, the independent samples t-test can be validly conducted.

Significance and Magnitude of Improvement as Early Indicators of Model Effectiveness

Both groups showed statistically significant improvements.

Table 1.4 Results of the Significance Test for Improvement in Each Group

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	Pretest experiment - Posttest experiment	-33.83333	6.29769	1.14980	-36.18493	-31.48174	-29.426	29	.000
Pair 2	Pretest control - Postest control	-8.03333	8.68007	1.58476	-11.27453	-4.79214	-5.069	29	.000

None of the 95% confidence intervals include zero, confirming that the increase is not due to chance. The t-value for the experimental group is significantly larger (-29.426 vs. -5.069), indicating a very strong effect size compared to the control group.

Interpreting Learning Effectiveness through Normalized Gain (N-Gain) Analysis

Table 1.5 Results of the Normalized Gain (N-Gain) Calculation for Learning Effectiveness

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Ngain_skor	30	.49	1.00	.7556	.13864
Ngain_persen	30	48.84	100.00	75.5644	13.86358
Valid N (listwise)	30				

The experimental group's average N-Gain of 0.7556 (75.56%) falls into the high-effectiveness category (Hake, 1999: > 0.70).

Some students achieved a perfect N-Gain (1.00/100%), indicating complete mastery of the material following the intervention. A standard deviation of 13.86% and a wide range of values (48.84% – 100%) indicate variation in individual responses, which may be influenced by students' motivation, learning styles, or prior knowledge.

4. Discussion

Implications of the Research Findings for the Effectiveness of the Station Rotation Model in Arabic Language Instruction

Research has shown that the station rotation model (Teacher Station, Multimedia, Collaboration, Creativity) substantially improves Arabic speaking skills, as evidenced by a 25.80-point difference in improvement between the experimental and control groups, as well as the achievement of perfect scores (100), indicating mastery learning. This

model embodies differentiated instruction by accommodating various learning styles, while also implementing spaced repetition—which is crucial for memorizing vocabulary and phrases. This multimodal and balanced approach aligns with Communicative Language Teaching (CLT), addressing the tendency toward overly textual Arabic language pedagogy.

Practical implications for teachers include designing activities that distinguish the function of each station (e.g., pronunciation correction at the teacher station, role-play at the collaboration station) using data from the first rotation as a diagnostic assessment to modify instruction for students with low N-Gain scores, and shifting the teacher's role to that of a facilitator supported by professional development in digital content and rotation-based classroom management.

This model serves as an integrative bridge between traditional methods (language structure) and modern approaches (CLT), and provides empirical evidence for the theory of differentiated instruction in the context of foreign language learning, particularly regarding productive oral skills. These findings expand upon the study (ALBELAZI & Abdullah, 2022) by demonstrating the specific effectiveness of the model in the areas of pronunciation, fluency, and contextual comprehension—topics that have been recognized as key components of school education programs starting at the elementary level. Consequently, the station rotation model is well-suited to serve as a standard approach in the design of blended learning for 21st-century Arabic language skills.

Validity of Statistical Analysis Based on Normality Test Results

In quantitative research, data normality (a natural distribution resembling a bell curve) is a key requirement for valid conclusions. Normally distributed data reflects the reality that some students' scores are very low, most are moderate, and some are very high. Without normality, differences in improvement could be statistical artifacts rather than a real effect of the station rotation model.

Test results indicate that all groups (experimental/control) and measurement time points (pre/posttest) meet the normality assumption. This "well-behaved" data provides a solid foundation for appropriate statistical procedures. Since the assumptions of normality (and homogeneity) are met, the difference in improvement between the experimental and control groups can be claimed as a real effect of the station rotation model, not due to technical anomalies in the data.

Practical Implications for Arabic Language Teachers include: Students' abilities are naturally distributed; teachers need not be alarmed by this diversity, as the station rotation model can accommodate the full spectrum of abilities. Standardized pre- and post-tests; teachers should administer initial and final tests to assess students' starting points, measure the method's effectiveness, and identify students requiring special attention. Statistical and pedagogical validity are inseparable; a model tested only on non-normal data cannot be generalized to heterogeneous classes.

This study demonstrates that, with the right design, data on Arabic language proficiency can meet normality assumptions, thereby enabling other researchers to confidently employ more powerful parametric statistics. The research instrument is sensitive and capable of distinguishing proficiency levels proportionally, addressing the issue of tests being too easy or too difficult. This study underscores that responsible scientific claims must be grounded in reliable data; tests of normality and homogeneity are standards of scientific ethics in Arabic language pedagogy.

Special Discussion on Homogeneity Considering Initial Parity

Analysis results demonstrate that prior to the intervention, the experimental and control groups exhibited nearly identical levels of variation in Arabic speaking ability (homogeneous). This means both groups were tested on an equal footing, so the 25.80-point improvement can be honestly attributed to the station rotation model, not to an initial advantage of one group. Homogeneity serves as a "methodological bridge" connecting raw data to pedagogical conclusions.

This model is effective for both homogeneous and heterogeneous classes (such as madrasahs/pesantren with students of highly varied abilities). The model does not require students to be "masked" beforehand; rather, it works optimally under natural classroom conditions. This study reminds us that pedagogical validity is inseparable from methodological validity; claims of a model's success that are not tested on comparable groups will be fragile.

Meeting the assumption of homogeneity is not merely a statistical "checkbox," but rather an ethical and scientific foundation that makes conclusions about the superiority of the station rotation model academically accountable and practically relevant for teachers in the field.

Significance and Magnitude of Improvement as Indicators of Model Effectiveness

The experimental group (station rotation model) improved by 33.83 points, while the control group (conventional) improved by only 8.03 points. The 25.80-point difference indicates a substantial advantage of the station rotation model. The 33.83-point increase reflects qualitative changes (from isolated words to simple sentences, from stuttering to fluency, from passive to confident communication), whereas the 8.03-point increase represents only a minor improvement that barely alters oral performance in a meaningful way. The stronger effect size indicates that most experimental students experienced consistent improvement. These findings are consistent with blended learning theory (Jayadi dkk., 2025)which posits that the combination of face-to-face and digital learning creates a synergy that enhances retention through various modalities. It should be noted that conventional learning is also effective but limited; the innovative model yields an improvement nearly four times higher.

Empirical evidence shows that structured spaced repetition through station rotation is effective for Arabic oral production (extending the scope of the theory from written memorization to the oral domain). Furthermore, the structure of time is more important than duration. Models with short stations (10–12 minutes) proved to be more effective, shifting the focus from "time on task" to "quality of task rotation."

Collaboration and Creativity stations provide a systematic structure for purposeful and repetitive language production. A 33.83-point increase serves as quantitative evidence that effective language production requires varied activity designs (peer interaction, creative expression), not merely mechanical drills.

Interpreting Learning Effectiveness through N-Gain Analysis

The station rotation model proved to have a high level of effectiveness with an average N-Gain value of 0.7556, reflecting a substantial and pedagogically meaningful improvement. Some students achieved a maximum N-Gain of 1.00 (100%), an indication

of perfect mastery: students not only pronounced vocabulary/sentences correctly, but also used them spontaneously and appropriately in communicative contexts.

A standard deviation of 13.86% and a wide N-Gain range (48.84%–100%) indicate natural variation in responses, not a failure of the model. Contributing factors: learning motivation, learning styles (auditory/visual/kinesthetic/social interaction), and prior ability. Students with exposure to Arabic at home develop more quickly at the Multimedia Station; risk-taking students benefit at the Collaboration/Creativity Station. Even the lowest range is 48.84% (nearly half the maximum potential), proving the model is inclusive—all students gain meaningful benefits, albeit to varying degrees.

These findings align with mastery learning (Firmansyah et al., 2021; Sudarmanto et al., 2021): an appropriate approach (sufficient time, continuous feedback, varied methods) enables most students to master the material. Station rotation allows for repetition, practice, and internalization from various perspectives. Although the effectiveness is high (0.7556), variation persists and is explained by individual factors (motivation, learning style). Mastery learning is a journey with different paces and paths, not a uniform endpoint. A minimum score of 48.84% (still "moderately effective") indicates that even the least responsive students still benefit—a strong argument for adopting the model in heterogeneous classrooms.

Variation in N-Gain is driven by differences in readiness (prior ability) and learning profiles, providing quantitative justification for differentiating approaches. The station rotation model provides a natural structure for differentiation. It shifts the measurement from a dichotomous scale (pass/fail) to a spectrum of mastery levels (N-Gain 48.84%–100%). It promotes growth-oriented pedagogy over threshold-oriented approaches.

Visual Documentation as Supporting Evidence of the Success of the Station Rotation Model

This visual documentation serves as additional evidence that reinforces the ecological validity of the research and demonstrates that statistically significant improvements stem from dynamic, contextual, and student-centered learning practices. Therefore, these images are not merely illustrations; rather, they are an essential part of the research narrative that illustrates how the station rotation model is implemented and its impact on the actual learning environment.

Figure 1.2: Learning activities using the station rotation method

This visual documentation serves as additional evidence that reinforces the ecological validity of the research and demonstrates that statistically significant improvements stem from dynamic, contextual, and student-centered learning practices. Therefore, these images are not merely illustrations; they are an essential part of the research narrative that illustrates how the station rotation model is implemented and how it impacts the real-world learning environment.

5. Conclusion

Based on the data analysis and discussion of the research findings, it can be concluded that the Station Rotation Blended Learning Model significantly improves students' Arabic speaking skills (maharah al-kalam). The main findings of this study consist of three key components.

First, it was demonstrated that this model is highly effective in quantitative terms. The experimental group experienced a significant average increase of 33.83 points, far surpassing the control group's increase of only 8.03 points. An N-Gain analysis of 0.7556 and strong statistical evidence from the paired-sample t-test ($p < 0.001$) indicate a significant improvement and the quality of that improvement.

Second, the research hypothesis has been proven successful. Empirically, the hypothesis that the station rotation model is more effective than conventional methods has been accepted. This model has the advantage of an integrated design, which combines the principles of blended and differentiated learning through four stations: Teacher, Multimedia, Collaboration, and Creativity. This configuration systematically allows for repeated practice (repetition space), enables variations in learning styles, and creates a safe, low-anxiety learning environment (low emotional filter). Psychologically, this configuration encourages students to speak up more boldly.

Third, this study offers pedagogical benefits and practical applications in the real world. With this innovative learning model, Arabic language teachers can address classic challenges in teaching oral skills, particularly speaking anxiety and a lack of opportunities for contextual practice. The Station Rotation Blended Learning Model is recommended as a strategic alternative for the Arabic language curriculum because its organized rotational structure ensures that all students are actively and equally engaged. Its use aims not only to improve the quality of students' oral outcomes but also to help them develop broader, student-centered 21st-century communication skills.

This study demonstrates that the Station Rotation Model is significantly and substantially more effective than conventional methods in improving Arabic speaking skills (maharah al-kalam). This effectiveness is evident not only in statistical figures but is also reflected in qualitative changes in students' speaking abilities—shifting from disjointed to structured, from hesitant to fluent, and from passive to confident communication.

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