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Intervention Using Visual-Scaffolding Nahw Grammar Charts: A Quasi-Experimental Study on I'rāb Accuracy and Sentence Structure in Pesantren

Deva Hanafi, Universitas Sains Al-Qur'an, Indonesia
Asep Sunarko, Universitas Sains Al-Qur'an, Indonesia
Ahmad Zuhdi, Universitas Sains Al-Qur'an, Indonesia

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***Corresponding author:**
Name: Asep Sunarko
Email: asepsunarko@unsiq.ac.id

Abstract

This study aims to examine the effectiveness of a visual-scaffolding-based Nahwu formula chart intervention on students' grammatical ability. Using a quantitative, quasi-experimental design (One-Group Pretest-Posttest Design), this study involved 30 students at Fatkhul Mu'in Ali Masykur Islamic Boarding School in Wonosobo as research subjects. Data collection techniques included tests, treatment, observation, and documentation. The results of the study show a significant increase in the average scores. The lowest student score improved from 38 to 63, while the highest score reached 96. The effectiveness analysis using the N-Gain score yielded a moderate value. These findings confirm that the use of formula charts as a visual instrument can reduce students' cognitive load and facilitate pattern recognition in Arabic syntactic analysis. This study recommends the integration of visual media into the *ilmu alat* curriculum in Islamic boarding schools to accommodate the learning styles of contemporary students.

Keywords: Nahwu Grammar Chart, Visual-Scaffolding, I'rāb Accuracy, Quasi-Experimental.

Introduction

For a long time, Nahwu (Arabic grammar) has been at the heart of learning in Islamic boarding schools. Anyone who has spent time in this environment understands how central it is not just as a subject, but as a tool that opens the door to understanding *kitab kuning* (Zarkasyi, 2020). Without Nahwu, reading classical texts becomes extremely difficult, even risky, because a small mistake in grammar can lead to a very different meaning(Sunarko et al., 2025). That is why Nahwu is often seen as more than just grammar; it is a way of thinking, a kind of language logic that helps protect meaning, especially in religious texts. In many ways, learning Nahwu is closely tied to intellectual discipline, patience, and careful reasoning (Hasyim, 2025).

In practice, students are expected to master *i'rāb*, the skill of identifying grammatical roles and determining the correct endings of words(M. Kholis Amrullah, 2021). This is particularly important when dealing with unvowelized Arabic texts, where there are no visual clues to guide pronunciation or meaning (Abdelgadir, 2021). Ideally, after years of studying Nahwu, students should feel confident approaching such texts. They should be able to break down sentences, recognize patterns, and arrive at accurate interpretations. But what often happens is quite different. Many students can recite rules smoothly, sometimes even beautifully, yet hesitate when they are asked to analyze a new sentence on their own. They pause, rethink, and sometimes guess, unsure whether their reasoning is correct.

This situation is not unique to one place it can be seen in many pesantren, including Fatkhul Mu'in Ali Masykur. Here, like in many traditional institutions, students spend a lot of time engaging with classical texts such as *Al-Ajūrrūmiyyah* and *Alfiyah Ibn Mālik*. Memorization is a big part of the process, and for good reason (Hoque, n.d.). It helps preserve knowledge and keeps students connected to a long scholarly tradition that has been passed down for centuries. There is a certain beauty in this continuity, where students today learn the same texts that were studied by scholars in the past(Guefara et al., 2025).

However, alongside this strength, there is also a recurring challenge. Memorizing is not the same as understanding, and understanding does not always mean being able to apply. In many cases, students can recall rules when prompted, but struggle to use them when faced with real text. The knowledge remains somewhat "distant," not fully integrated into their way of thinking. This is where the real difficulty lies not in the lack of knowledge, but in the gap between knowledge and use (Levin, 2013).

In the classroom, this gap becomes very visible. Some students can explain grammatical concepts quite clearly when asked, but struggle when they face a sentence that looks slightly different from the examples they are used to (Dzimar et al., 2025). Others can follow along during lessons, nodding in understanding, but become confused when working independently. It is not that they are not trying it is that the process itself feels heavy. When reading a sentence, they have to think about many things at once: what type of word they are looking at, what rule applies, what element is governing the sentence, and what ending should be used. All of this happens almost simultaneously, and it can quickly become overwhelming.

This is where the idea of cognitive overload becomes relevant. The challenge is not always that Nahwu is too difficult, but that the learner is trying to process too many things at once without a clear structure. When everything has to be held in the mind at the same time, it becomes easy to lose track. Students may start correctly

but then become unsure halfway through their analysis. Some begin to rely on intuition rather than structured reasoning, while others become hesitant to even attempt analysis for fear of making mistakes.

Over time, this situation can affect more than just technical ability. It can also influence how students feel about learning Nahwu itself. What was initially seen as an important and meaningful subject may start to feel intimidating or even frustrating. When students repeatedly experience confusion, they may lose confidence in their ability to improve (Dowd et al., 2015). This is something that educators in pesantren often notice, even if it is not always explicitly discussed.

Looking at this situation, it becomes clear that what students need is not less material, but better support in processing it. The goal is not to simplify Nahwu to the point that it loses its depth, but to make the path toward understanding more accessible. In other words, students need guidance not only in what to learn, but in how to think through what they are learning (Clark et al., n.d.).

One approach that responds to this need is the use of Visual Scaffolding through Nahwu formula charts. The idea behind this approach is actually quite simple. Instead of presenting grammatical rules only in verbal form, they are also represented visually in a structured way. Inspired by Vygotsky's concept of scaffolding (Vygotsky, 1978), these charts act as temporary supports that guide students step by step through the process of analysis. They help reduce the burden on memory by organizing information in a way that is easier to follow.

When students use these charts, they are not just memorizing they are following a pathway. The chart helps them see how different parts of a sentence are connected, almost like a map that shows where to go next. For example, instead of trying to remember abstractly where a *fā'il* should appear, they can see its position in relation to the verb. The same applies to objects (*maf'ūl bih*) or possessive constructions (*muḍāf ilaih*). This makes the process feel more concrete and less abstract.

This visual dimension is particularly helpful for many students today, who are often more responsive to structured and visual forms of learning. It aligns with what is described in Dual Coding Theory (Mayer, 2009), where learning becomes more effective when information is processed through both verbal and visual channels. In traditional Nahwu learning, students rely heavily on verbal explanations and memorized texts. By adding visual support, the formula charts provide another entry point into understanding.

At Fatkhul Mu'in Ali Masykur, the use of these charts is introduced carefully, without replacing the traditional learning system. The *kitab kuning* remains central, and memorization is still valued(Kurniawan & Sudarno, 2026). The charts are simply an additional tool a kind of guide that students can turn to when they feel unsure. Over time, as they become more familiar with the patterns, they begin to rely less on the charts and more on their internal understanding. In this sense, the charts are not a shortcut, but a bridge.

Interestingly, the impact of this approach is not only seen in students' accuracy, but also in their attitude toward learning. With clearer guidance, students tend to feel more confident in trying to analyze sentences. They are less afraid of making mistakes and more willing to engage actively. This shift may seem subtle, but it is actually very important. Confidence plays a key role in learning, especially in subjects that require careful and detailed thinking like Nahwu.

Another important aspect is that the charts encourage a more systematic way of thinking. Instead of jumping from one rule to another, students learn to follow a

sequence. This helps them build habits of structured analysis, which are useful not only in Nahwu but in other areas of learning as well. Over time, this kind of thinking can become internalized, making the learning process smoother and more efficient. Despite its potential, this kind of approach has not been widely explored in traditional pesantren contexts. Much of the existing research on Arabic language learning focuses on modern educational settings or digital tools (Auliya et al., 2025). As a result, there is still limited discussion on how simple, non-digital strategies like formula charts can support learning in more traditional environments. This study, therefore, tries to offer a small contribution in that direction.

The idea behind this research is quite grounded: if students are struggling not because they lack knowledge, but because they struggle to organize it, then helping them structure their thinking may lead to meaningful improvement. By turning grammatical rules into clearer and more accessible patterns, Nahwu becomes something that students can actively work with, rather than something they simply try to remember.

Based on this background, the study aims to examine how the use of Nahwu formula charts influences students' ability to perform i'rāb and analyze sentence structures. The objective of this study is not to claim that one method is better than the other, but to explore whether this additional support can make a noticeable difference. To enhance clarity and ensure alignment with the sub-sections presented in the discussion, the objective of this study can be broken down into several specific objectives, such as: (1) examining the impact of Nahwu formula charts on i'rāb ability, (2) analyzing the differences in understanding sentence structures between students who use visual support and those who use conventional methods, and (3) evaluating whether the additional visual support can lead to a significant difference in students' achievements.

In the end, this research returns to a broader question about learning in pesantren today. How can we preserve strong traditions while also responding to the needs of contemporary learners? The answer may not always require major changes. Sometimes, small adjustments like providing clearer guidance or adding visual structure can have a meaningful impact.

If students can approach Nahwu with greater clarity, confidence, and consistency, then the learning process becomes not only more effective, but also more meaningful. And if that can be achieved while still honoring the richness of the tradition, then it is a direction worth exploring further.

Method

This study employs a quantitative approach with a quasi-experimental design(Zuhriyah et al., 2026). Considering the limitations in conducting full randomization within the pesantren environment, which follows a fixed curriculum schedule, the researcher applied a One-Group Pretest-Posttest design (Creswell, 2014). In this design, a single group of subjects is observed at the initial stage (pre-test), then given an intervention in the form of Nahwu formula charts, and concluded with a final observation (post-test) to measure the extent of the treatment's effect on the dependent variable.

The research was conducted at Fatkhul Mu'in Ali Masykur Islamic Boarding School in Wonosobo. The selection of this site was based on its characteristics as a pesantren that still maintains a strong tradition in teaching *turāth* (classical texts), while also being open to innovations in instructional media. The research subjects consisted of 30 students. The sampling technique used was purposive sampling,

namely the selection of samples based on specific considerations (2017), in this case students who are in the transitional phase from vocabulary acquisition to the practice of syntactic analysis (*iʻrāb*).

The researcher integrated four data collection techniques to achieve valid data triangulation; test, treatment, observation, and documentation. The test instrument consisted of 20 items covering the analysis of unvowelized texts (*text gundul*) and sentence construction. Prior to its use, the instrument was tested for content validity through expert judgment by senior teachers at the pesantren. Based on the raw data, the students' initial scores ranged from 38 to 82, which later served as a baseline for comparison after the intervention was administered.

The intervention was conducted over eight sessions. The researcher implemented three scaffolding phases: (1) Modeling, in which the researcher demonstrated how to use the formula charts; (2) Guided Practice, in which students attempted to perform *iʻrāb* with the assistance of the charts and guidance from the researcher; and (3) Independent Practice, in which students were gradually released to analyze texts independently (Wood et al., 1976).

Observation was conducted in a structured manner using an observation sheet. This aimed to record students' activities, ranging from the time required to complete a sentence to changes in cognitive behavior, such as reduced hesitation when determining *iʻrāb* markings on difficult words.

The researcher collected documents in the form of the profile of Fatkhul Mu'in Ali Masykur Islamic Boarding School in Wonosobo, the Nahwu teaching syllabus, and archives of students' worksheets during the treatment period. This documentation serves as authentic data to support the quantitative findings.

The data collected from 30 respondents were processed through two stages of statistical analysis: descriptive statistics and inferential statistics. Descriptive statistics were used to describe the distribution of scores, mean values, and standard deviations. Based on the available data, the post-test mean showed a significant increase compared to the pre-test. Inferential statistics employed the Paired Sample T-Test to determine whether the difference in scores before and after the intervention was statistically significant or merely due to chance. In addition, to assess the effectiveness of the intervention, the Normalized Gain (N-Gain Score) formula developed was used by (Hake, 1998).

Finding and Discussion

The study conducted on 30 students at Fatkhul Mu'in Ali Masykur Islamic Boarding School in Wonosobo shows a significant transformation in Arabic grammatical ability. Based on the data collected through the test instruments, the distribution of students' scores shifted in a more positive direction after the intervention.

Tabel 1. Pre-test and Post-test Statistical Indicators

Statistical Indicators	Pre-Test	Post-Test	Improvement
Respondent (N)	30	30	-
Minimum Score	38	63	+25
Maximum Score	82	96	+14
Average (Mean)	57,20	77,53	20,33

The average pre-test score of 57.20 indicates that, prior to the intervention, students' ability to perform *i'rāb* was at a low to moderate level. However, after the implementation of the visual-scaffolding–based Nahwu formula charts, the average score increased to 77.53. This indicates that the visual intervention was able to significantly enhance the students' overall understanding.

To precisely measure the effectiveness of the intervention, the Normalized Gain (N-Gain) was calculated. This calculation is crucial for assessing the effectiveness of the treatment without being influenced by differences in the students' initial abilities (Hake, 1998).

$$g = \frac{\text{Mean Posttest} - \text{Mean Pretest}}{\text{Skor Maksimal} - \text{Mean Pretest}}$$

$$g = \frac{77.53 - 57.20}{100 - 57.20} = 0.47$$

An N-Gain value of 0.47 indicates that the Nahwu formula chart intervention falls into the "Moderate" effectiveness category. Individually, some students experienced very significant improvements, with scores increasing from 38 to 63, and some even reaching nearly perfect scores of 96.

The Transformative Power of Visual Scaffolding in Nahwu

The core findings of this study reveal a fascinating shift in how students interact with Arabic grammar. The implementation of visual scaffolding, specifically through Nahwu formula charts, led to a highly noticeable and deeply encouraging improvement in students' grammatical competence, particularly in the intricate art of performing *i'rāb* (syntactical analysis)(Reno Ryan Saputra et al., 2026). However, what makes these findings truly significant is that the improvement is not merely numeric. It is not just about a spike in test scores; rather, it reflects a fundamental transformation in the way students perceive, approach, and digest the complexities of Nahwu.

Before this intervention, observing the students revealed a common struggle: Nahwu was often viewed as a dense, impenetrable forest of abstract rules. After being introduced to the visual formula charts, the students' approach became markedly more systematic(Huda et al., 2023). Based on the qualitative and quantitative results gathered from the pre-test and post-test data, we witnessed a distinct paradigm shift. Before the implementation of the charts, students' abilities were widely scattered. A large portion of the class was visibly struggling to grasp the foundational concepts, often conflating different grammatical rules. Yet, post-intervention, their scores not only improved but became much more tightly concentrated within a higher performance bracket. This consolidation indicates that the learning process did not just become more effective for a select few "gifted" learners; it became more equitable, accessible, and consistent across the entire classroom (Peters, 2022).

Beyond the Numbers: Decoding the Statistical Leap

To truly understand the impact of this intervention, we must look at what the statistical data represents on a human level(Nur Azizah & Nashoih, 2024). The numbers tell a compelling story of academic rescue and refinement. In the pre-test, the minimum score recorded was a struggling 38. In the post-test, the lowest score

in the class jumped to 63. This is a profound shift. It indicates that the students who initially faced the most severe difficulties, those who were essentially being left behind by traditional instructional methods, were successfully pulled up to a solid, basic level of understanding(Reno Ryan Saputra et al., 2026). The charts provided them with a lifeline.

Simultaneously, the intervention did not hold back the advanced learners. The maximum score in the class rose from an 82 to an impressive 96. This proves that the visual scaffolding also served as an advanced tool for higher-performing students, allowing them to refine their knowledge, catch their own minor errors, and polish their mastery of *i'rāb*.

Perhaps the most telling metric of all is the dramatic increase in the class's mean score, which surged from 57.20 to 77.53, a solid gain of 20.33 points. This broad-spectrum improvement strongly suggests that the visual charts resonated with the collective learning psychology of the group. A pre-test average of 57.20 paints a picture of a classroom where many students were likely surviving on rote memorization or pure guesswork when asked to determine the grammatical ending of an Arabic word. The post-test average of nearly 78, however, reflects a classroom that has traded guesswork for a structured, confident, and reasoned understanding of syntactical rules (Zarkasyi, 2020).

When we evaluate the N-Gain score of 0.47, we place the intervention's effectiveness squarely in the "moderate" category. While an academic purist might constantly seek "high" effectiveness, context is absolutely crucial here (Muradi, 2016). We must remember the subject matter: Nahwu is notoriously perceived by students as one of the most abstract, dry, and intellectually demanding branches of Islamic studies. To achieve a moderate, nearly 50% gain in normalized learning outcomes in a subject that usually yields flatlined progress is actually a monumental victory. It provides solid, undeniable evidence that the intervention works, while simultaneously leaving an exciting runway for educators to further tweak, adapt, and develop these visual tools for even greater future impact.

Alleviating the Cognitive Burden Through Visual Support

Why did a simple chart make such a profound difference? The most logical explanation lies in the realm of cognitive load. In conventional Nahwu instruction, the mental demands placed on a student are staggeringly high(Asiah et al., 2022). A learner is asked to juggle several highly abstract elements at the exact same time: they must recall vocabulary, remember complex grammatical rules, identify syntactic relationships within a sentence, and apply all of this to unvowelized Arabic texts (often referred to as *Kitab Kuning* or bare text). For a beginner or intermediate learner, this cognitive bottleneck easily leads to mental overload, frustration, and eventual disengagement (Zhao & Wang, 2025).

The Nahwu formula charts act as an external hard drive for the students' working memory, drastically making the analytical process more manageable. By pulling the abstract rules out of the students' heads and projecting them onto a visual, highly structured roadmap, the charts allow learners to follow a clear, linear line of reasoning. Instead of trying to mentally juggle a dozen intersecting rules, they can simply consult the chart to guide their logic.

Consequently, the learning experience transitions from an intimidating leap of faith into a manageable, step-by-step journey. What previously felt like a tangled web of unclear linguistic constraints is smoothly transformed into a sequence of logical, predictable steps. This cognitive relief does more than just improve

academic understanding; it breathes life into the students' confidence. When the mental fog clears, students are suddenly much more willing to engage with complex Arabic sentences without the paralyzing fear of instant failure.

From Guesswork to Precision: Elevating I'rāb Accuracy

Another incredibly vital outcome of this research is the sharp spike in students' accuracy when performing *i'rāb*. Before the visual charts were introduced, it was common to see students stumbling when trying to determine the correct grammatical endings, especially when confronted with unfamiliar vocabulary or heavily compounded sentence structures. Their answers were often erratic and inconsistent. On Monday, they might guess correctly, but on Tuesday, faced with a similar sentence, they would fail. This inconsistency stemmed from a fragile foundation: they were memorizing instances rather than understanding the underlying relationships between the words(Kojin & Choiruddin, 2022).

The formula charts changed this dynamic entirely by providing a true north compass. Instead of relying on what "sounded right," students were guided to approach every single word through a calm, methodical, analytical process. The charts taught them to ask three sequential questions: First, what is the word's position or function in the sentence? Second, what is the governing element (*'amil*) affecting it? And third, based on its word type, what is the appropriate grammatical marker (*'alamat*)?

This step-by-step forensic approach helped them abandon the stressful habit of guessing. Over the course of the study, this analytical process became second nature to the students. As they practiced repeatedly with the visual aids, they began to subconsciously internalize the logic behind *i'rāb*. This internalization is beautifully reflected in the post-test data, where the dispersion of scores narrowed significantly. The class became a cohesive unit of analytical thinkers rather than a fragmented group of guessers.

Honoring Tradition While Embracing Modernity in the Pesantren

The implications of these findings extend far beyond the walls of this specific classroom; they speak directly to the broader pedagogical practices within the *pesantren* (Islamic boarding school) context. For centuries, traditional teaching methods such as *sorogan* (individualized reading and correction) and *bandongan* (collective lecture and dictation) have been the lifeblood of Islamic education. These methods possess deep historical, spiritual, and academic value, and they have successfully produced generations of scholars.

However, from a purely pedagogical standpoint, these deeply traditional methods rely overwhelmingly on verbal explanation, auditory processing, and intense textual analysis. In a modern educational landscape, we know that relying entirely on one or two modes of instruction means inadvertently leaving certain types of learners behind, specifically, visual learners (Pashler et al., 2008).

It is crucial to state that the introduction of visual scaffolding is not, and should never be viewed as, a threat or a replacement for these revered traditional approaches. Rather, it is a much-needed complement. The Nahwu formula charts serve as a vital bridge. They take the rich, complex verbal teachings of the *Kyai* or *Ustadz* and anchor them to concrete visual representations (Eilam & Gilbert, 2014).

This is incredibly relevant for today's generation of students, whose brains are heavily wired for visual information due to the multimedia-rich environment they grow up. By thoughtfully marrying the depth and rigor of traditional *pesantren*

methods with the accessibility of modern visual pedagogy, educators can create a vastly more balanced, inclusive, and effective learning ecosystem that respects the past while fully accommodating modern learning styles.

Fostering Autonomy: The Shift to Independent Problem-Solving

Beyond academic scores, one of the most rewarding behavioral changes observed during this study was the evolution of the students' independence. At the beginning of the research, the classroom dynamic was highly teacher-dependent. If a student hit a roadblock while analyzing a sentence, they would immediately stop and wait for the teacher to rescue them with an explanation. They lacked the tools to rescue themselves(Nur Azizah & Nashoih, 2024).

Following the integration of the formula charts, a noticeable shift occurred in the classroom culture: students became significantly more willing to wrestle with the problems on their own. The charts functioned as a dependable cognitive safety net. Because the students knew they had a reliable reference guide sitting on their desks, they felt brave enough to dissect and analyze complex Arabic sentences independently. They would trace the pathways on the charts, debate the rules with their peers, and formulate their own conclusions before finally raising their hands to seek validation from the teacher.

In this new dynamic, the role of the teacher beautifully transforms. The educator is no longer forced to be the exhausting, singular fountain of all direct knowledge; instead, they become a facilitator, a guide on the side who curates the learning experience and steps in only to correct course or provide deeper nuance. This shift perfectly encapsulates a modern, student-centered learning paradigm, where learners are active architects of their own understanding rather than passive receptacles for lectures.

Rewiring the Brain: The Synergy of Visual and Verbal Memory

To fully appreciate why these charts work, we must also look at how human memory functions. Traditional Nahwu instruction heavily prioritizes rote memorization (*hafalan*). Students are frequently required to memorize long, poetic treatises of grammar rules. While rote memorization is undeniably an excellent mental discipline and a cornerstone of classical learning, it has a distinct flaw: a rule memorized without a clear conceptual framework is incredibly difficult to apply in real-time, dynamic situations.

By introducing a strong visual component, the formula charts effectively trigger dual-coding in the students' brains. They are no longer just hearing the rule; they are *seeing* the rule's architecture. The charts help students visualize how abstract grammatical laws interact with one another in physical space. This makes the heavily complex information infinitely easier to encode into long-term memory and, more importantly, easier to retrieve when needed.

Instead of desperately trying to recall a disconnected, isolated rule during an exam, students begin to recognize structural patterns. This pattern recognition is the holy grail of language acquisition. It is especially vital in the *pesantren* environment, where students spend hours gazing at unvowelized classical texts. When staring at a sea of blank Arabic letters, the mental map provided by the visual charts gives the students a desperately needed anchor, allowing them to project the grammatical rules onto the blank text with precision.

Lowering the Affective Filter: Easing Anxiety and Building Confidence

Finally, we must address the emotional and psychological barriers to learning. A significant, yet often overlooked, benefit of this intervention was the sharp reduction in student anxiety. Let us be honest: learning Arabic grammar, and specifically navigating the unforgiving rules of *i'rāb*, is an intimidating endeavor. The constant fear of misidentifying a word's ending and thereby changing the entire meaning of a sacred text creates a high-stakes environment. This uncertainty breeds hesitation, kills participation, and erects a massive emotional wall (the affective filter) that blocks language acquisition (Benesch, 2013).

The inherently structured, predictable nature of the formula charts acts as an antidote to this anxiety. By offering a clear, unambiguous procedure to follow, the charts replace the terrifying void of the unknown with a comforting sense of direction. When a student feels lost, the chart tells them exactly where to look next. This drastically lowers their stress levels and creates a psychologically safe environment.

As the fog of anxiety lifts, the seeds of confidence begin to take root. We observed that as students realized they could successfully navigate the charts to find the correct answers, their demeanor changed. They began to sit up straighter, volunteer answers more frequently, and take intellectual risks without the fear of immediate embarrassment. This positive, upward spiral in their emotional attitude was arguably just as critical to their ultimate academic success as the charts themselves.

In conclusion, the overarching findings of this study offer a resounding validation of visual scaffolding. By utilizing Nahwu formula charts, educators can significantly demystify and enhance students' understanding of Arabic grammar. The undeniable leap in test scores, the newfound precision in executing *i'rāb*, and the profound shift from passive reliance to active, confident learning all point to an intervention that is deeply impactful.

While the statistical effectiveness resides in the moderate range, these results shine a bright light on the immense potential of this approach as a practical, scalable, and highly relevant teaching strategy for the modern era. The charts are not a magic wand, but they are a highly effective tool. With continued use, iterative refinement, and adaptation by passionate educators, visual scaffolding has the potential to permanently change the narrative around Nahwu transforming it from a feared academic hurdle into an accessible, engaging puzzle.

Ultimately, this study serves as a gentle reminder to the world of Islamic education: pedagogical evolution does not require the erasure of tradition. By thoughtfully intertwining the profound depths of classical *pesantren* teaching methods with intuitive, modern innovations like visual scaffolding, we can cultivate a learning environment that is not only highly effective but also deeply compassionate and responsive to the needs of the modern student.

Conclusion

This quasi-experimental study conducted at Pondok Pesantren Fatkhul Mu'in Ali Masykur, Wonosobo, demonstrates that the visual-scaffolding-based Nahwu formula chart intervention has a significant positive effect on the accuracy of I'rāb and students' mastery of sentence structure. Empirical findings show a consistent increase in the average score, from 57.20 in the pre-test phase to 77.53 in the post-test phase. The data analysis resulted in an N-Gain score of 0.47, indicating that the effectiveness of using this formula chart falls within the moderate category. This

success is also reflected in the improvement of individual student scores, where those who initially had the lowest scores were able to achieve better competency standards after receiving the intervention.

Conceptually, the use of formula charts has proven effective as a cognitive aid that can reduce students' mental load in processing abstract Arabic grammatical rules. This visualization facilitates students in performing pattern recognition more mechanically and logically, thereby minimizing errors in determining word positions and final vowel markings. In the pesantren environment, this visual-scaffolding approach is not intended to replace classical teaching traditions, but rather to serve as a complementary instrument that accelerates students' understanding of *turats* literature for the contemporary generation.

Based on these findings, educators in the pesantren environment are encouraged to begin integrating visual learning strategies to accommodate students' learning styles, which tend to be more responsive to graphic media. Pesantren institutions, particularly Pondok Pesantren Fatkhul Mu'in Ali Masykur, may consider developing supplementary modules based on formula charts as a strategic step to strengthen the foundational linguistic tools for beginner students. This is expected to help students overcome cognitive difficulties when applying Nahwu theory to the independent reading of Arabic texts.

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