







From Learning Styles to Learning Design: Understanding Multimodal Preferences in Technology - Enhanced Arabic Language Learning

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Abstract. This study explores students' learning style preferences in learning Arabic for communication at the beginner level. Understanding how learners prefer to receive and process information is crucial in designing effective and engaging Arabic language instruction, particularly for non-native speakers. A total of 306 students participated in a survey that examined their preferred learning styles based on the VARK model (Visual, Auditory, Reading/Writing, and Kinesthetic/Interactive). Descriptive analysis was employed to identify the dominant preferences among respondents. The findings revealed that the visual learning style was the most preferred ($M = 0.74$, $SD = 0.44$; 73.9%), followed by Reading/Writing ($M = 0.65$, $SD = 0.48$; 65.0%). Fewer students preferred Auditory ($M = 0.42$; 42.5%) and Interactive ($M = 0.34$; 34.3%) modes. The results suggest that learners of Arabic for communication favour visually rich and text-based approaches to language learning, reflecting their reliance on visual and textual cues to process Arabic's non-Latin script. These findings highlight the importance of integrating multimedia materials, digital reading exercises, and visual learning aids to enhance comprehension and motivation. The study concludes that Arabic language instruction should adopt a technology-enhanced multimodal approach, embedding visual and textual resources alongside interactive and auditory digital tools such as videos, pronunciation software, and gamified dialogues to foster balanced and inclusive language competence.

Keywords: Learning styles, Arabic for Communication, VARK model.

1 Introduction

Arabic has become an increasingly important language in today's globalized world, serving as a vital medium of communication in religious, cultural, diplomatic, business and tourism contexts. In Malaysia, Arabic is taught not only as a religious language but also as a means of intercultural communication, especially for students pursuing studies in hospitality, tourism, business, engineering and international relations. Recognizing the communicative function of Arabic, many higher education institutions have introduced courses such as basic Arabic for communication, which aim to equip learners

with essential linguistic skills for real-life interaction rather than focusing solely on grammar or memorization.

However, students learning Arabic as a foreign language often face challenges in pronunciation, vocabulary retention, and comprehension due to the distinct script, sounds, and structure of the language. These challenges may be compounded when the teaching methods do not align with the learners' preferred learning styles. According to Fleming and Mills's [1] VARK model, learners differ in how they process information; some learn best through visual representations (images, videos, diagrams), others through auditory input (listening and discussion), reading and writing activities (textual notes and exercises), or kinaesthetic and interactive experiences (role-play and hands-on tasks). When instructional approaches match learners' preferred modes, learning becomes more engaging and effective [2, 3].

In Arabic language learning, understanding these preferences is essential for improving teaching strategies and learner engagement. Studies have shown that visual and multimodal learning environments, for example those involving videos, infographics, and interactive online materials enhance comprehension and motivation among non-native Arabic learners [4, 5]. However, limited research has explored how Malaysian students, particularly at the beginner level, prefer to learn Arabic for communicative purposes rather than religious or literary contexts.

Therefore, this study aims to investigate the learning style preferences of students enrolled in a Arabic Language 1 course. By identifying the dominant learning modes, this research seeks to inform educators and curriculum designers on how to align pedagogical practices with student preferences, ultimately promoting more effective and enjoyable Arabic language learning experiences. Specifically, the study addresses the following objectives:

- i. To identify the most preferred learning styles among students learning Arabic Language 1.
- ii. To describe the distribution of preferences across the four VARK learning modes.
- iii. To discuss the pedagogical implications of these preferences for Arabic language instruction.

2 Literature Review

2.1 Learning Styles and Language Acquisition

The concept of learning styles has long been central to educational psychology and language pedagogy. Learning styles refer to individuals' consistent preferences in perceiving, processing, and retaining information [6]. Among the most widely recognized frameworks is Fleming and Mills's (1992) VARK model, which classifies learners as Visual, Auditory, Reading/Writing, or Kinaesthetic (Interactive). Visual learners rely on images, charts, and videos to make sense of information, while auditory learners

prefer listening to lectures and discussions. Reading/Writing learners favour textual input and written exercises, whereas kinaesthetic learners engage best through hands-on tasks, demonstrations, and role-play.

In second language acquisition, matching instructional methods to learners' dominant styles has been shown to improve comprehension, motivation, and retention [3]. Kolb's [2] experiential learning theory further supports this view, emphasizing that learning occurs through the transformation of experience, where reflection, conceptualization, and active experimentation interact to form meaningful understanding.

2.2 Learning Styles in Arabic Language Learning

Arabic presents unique linguistic and orthographic challenges for non-native learners. The language's diglossic nature, non-Latin script, and phonetic distinctions can impede initial learning, particularly in listening and writing skills [4]. Consequently, instructional strategies that incorporate visual aids and multisensory exposure, such as digital flashcards, infographics, and pronunciation videos have been found to enhance learners' engagement and reduce anxiety [7].

Several studies highlight the role of learning styles in Arabic language contexts. For example, Al-Mutairi [8] reported that visual and reading/writing approaches significantly improved vocabulary retention among university learners. Similarly, Al-Khalifa and Al-Ajlan [4] observed that multimedia-enhanced Arabic lessons catered effectively to auditory and visual learners, fostering stronger communicative competence. These findings indicate that visual-textual combinations are particularly beneficial for beginners, aligning with the broader literature on multimodal learning.

2.3 Learning Preferences and Digital Pedagogy

The integration of digital technologies and online platforms has transformed the way Arabic is taught and learned. Studies such as Zainuddin and Abdullah [5] emphasize that micro-credential and MOOC-based learning environments allow for personalized and flexible learning experiences that align closely with individual preferences. YouTube-based and mobile learning kits, such as e-Kalam: Arabic Made Easy and e-Safar Sa'īd: The Wonders of Malaysia demonstrate the potential of visual and interactive media in supporting language comprehension and speaking practice [9].

Moreover, research in open and distance learning contexts [10] [11] suggests that learner-centred course design especially when guided by learning style analysis can enhance satisfaction, engagement, and overall performance. As such, understanding students' preferred learning styles becomes crucial for optimizing technology-enhanced Arabic courses aimed at communication rather than traditional grammar-based instruction.

2.4 Research Gap

While numerous studies have explored learning styles in English and other foreign-language contexts, limited research focuses specifically on Arabic for communicative purposes, particularly within the Malaysian higher-education setting. Most Arabic programs still emphasize reading classical texts or religious content, often neglecting modern communication skills and learner preferences. This study addresses that gap by examining the learning style preferences of students enrolled in Arabic Language 1, using a descriptive approach to identify dominant modes and propose pedagogical implications.

3 Methodology

3.1 Research Design

This study employed a quantitative descriptive research design to examine students' learning style preferences in the Arabic Language 1 course. The descriptive approach was selected to identify and summarize learners' dominant modes of learning using frequency, mean, and standard deviation analyses. This method provides an objective overview of learners' tendencies and supports the development of pedagogical strategies tailored to student preferences [12].

3.2 Participants

A total of 306 students participated in this study. All respondents were enrolled in the Arabic Language 1 (BLLW1212) course offered at a Malaysian public university. The participants represented a variety of undergraduate programs in computer science and engineering, including software development, networking, computer security, electrical, electronic, and mechatronic engineering. Students from the computer science-related programs made up the largest proportion of the sample, followed by those from engineering and technology fields. This distribution reflects the interdisciplinary composition of the Arabic Language 1 course, which attracts learners from diverse technical and academic backgrounds.

3.3 Instrument

Data was collected using an online entrance survey questionnaire distributed via Google Forms at the beginning of the semester. The instrument consisted of demographic questions (e.g., age, program, prior exposure to Arabic) and one key item adapted from the VARK Learning Styles Model [1]. The central question "How do you prefer to learn?" allowed respondents to select multiple options from the following categories:

- i. Visual – videos, images, charts

- ii. Auditory – listening to recordings, conversations
- iii. Reading/Writing – text-based learning, exercises
- iv. Interactive – group discussions, role-playing

The question was designed to capture natural learning inclinations rather than force a single-category classification. Open-ended responses were also invited to gather qualitative insights into students' learning expectations and experiences.

3.4 Data Collection Procedure

The survey was conducted during the first week of the March 2025 and October 2025 semester. Students were informed about the research objectives and assured of confidentiality and voluntary participation. Responses were automatically recorded in Microsoft Excel and later exported to SPSS29 for statistical analysis. After data cleaning, a total of 306 valid responses were retained for analysis.

3.5 Data Analysis

Descriptive statistics: frequency, percentage, mean, and standard deviation were used to analyse students' learning style preferences. Each learning style (Visual, Auditory, Reading/Writing, Interactive) was coded as a binary variable (1 = selected; 0 = not selected). Mean values represented the proportion of respondents selecting each mode. Visualizations such as bar charts and tables were generated to illustrate the distribution of preferences. The findings were subsequently discussed with reference to the VARK learning model and existing literature on Arabic language pedagogy to draw pedagogical implications and insights.

4 Findings and Results

The descriptive analysis focused on identifying students' preferred learning styles in the Arabic Language 1 course. Based on the VARK framework, four main categories were analysed: Visual, Reading/Writing, Auditory, and Interactive learning styles.

Table 1: Descriptive Statistics of Students' Learning Style Preferences (N = 306)

Learning Style	N	Mean	Std. Deviation
Visual	306	0.74	0.44
Reading/Writing	306	0.65	0.48
Auditory	306	0.42	0.50
Interactive	306	0.34	0.48

* Mean values represent the proportion of students selecting each learning style (1 = preferred, 0 = not preferred).

Table 2: Frequency and Percentage of Students' Preferred Learning Styles

Learning Style	Frequency	Percentage (%)
Visual	226	73.9
Reading/Writing	199	65.0
Auditory	130	42.5
Interactive	105	34.3

* Percentages represent the proportion of students selecting each learning style (multiple responses allowed).

As shown in Tables 1 and 2, most respondents demonstrated a clear preference for visual learning ($M = 0.74$; 73.9%), indicating that most students learn Arabic best through videos, images, charts, and other visual representations. The reading/writing style ranked second ($M = 0.65$; 65.0%), revealing that many students also value text-based materials, written exercises, and note-taking practices.

The auditory style ($M = 0.42$; 42.5%) and interactive style ($M = 0.34$; 34.3%) were less dominant but still meaningful, suggesting that a substantial portion of learners benefit from listening activities, group work, and role-playing. Overall, students exhibited multimodal tendencies, with many selecting more than one preferred learning mode.

5 Discussion

This study provides a contemporary interpretation of learning style preferences among students in an Arabic Language 1 course by situating the findings within the context of technology-enhanced and multimodal learning environments. While traditional research has often treated learning styles as static categories, this study reframes them as dynamic learning preferences that can inform the design of flexible, technology-mediated instruction. The findings highlight the predominance of visual (73.9%) and reading/writing (65.0%) modes, suggesting that students rely heavily on visual and textual cues to process and internalize Arabic's non-Latin script.

5.1 Visual and Reading/Writing Preferences in the Digital Context

The strong inclination toward visual and textual learning aligns with the increasing integration of multimedia in higher education. In the context of Arabic, visual representations such as animated scripts, infographics, and digital flashcards can reduce the cognitive load associated with decoding new orthographic symbols. Likewise, textual reinforcement through online exercises, micro-quizzes, and note-taking apps supports memory consolidation and literacy development. [8] and [4] also echoed the same findings where they found that visual reinforcement helps non-native learners build confidence and motivation when engaging with Arabic text. [10] also noted that reading and writing activities enable deeper cognitive processing and long-term language retention. In the context of Arabic for communication, written tasks such as fill-in-the-blank exercises, short dialogues, and vocabulary notes play a crucial role in supporting compre-

hension and memory. These results support the argument that visual and textual modalities are not merely personal preferences, but cognitive strategies shaped by the linguistic characteristics of Arabic and the affordances of digital tools.

5.2 Expanding Auditory and Interactive Learning through Technology

Although auditory and interactive preferences were less dominant, they represent critical components for achieving communicative competence. Digital platforms now enable the integration of these less-preferred but essential skills through podcasts, pronunciation recognition software, gamified dialogue simulations, and AI-based conversational agents. The relatively lower selection of auditory and interactive modes may reflect limited exposure to these digital forms rather than a true disinterest. This finding underscores the need to expand technologically supported speaking and listening activities that encourage learners to move beyond passive text-based engagement.

5.3 Toward a Technology-Enhanced Multimodal Pedagogy

The results reaffirm the importance of a multimodal teaching approach, consistent with the principles of Universal Design for Learning (UDL), which emphasizes flexible modes of representation, engagement, and expression. By aligning instruction with learners' dominant and emerging preferences, educators can create adaptive learning environments that foster autonomy and sustained motivation. Tools such as e-Kalam: Arabic Made Easy and e-Safar Sa'īd: The Wonders of Malaysia exemplify how micro-credential or blended modules can personalize Arabic instruction, combining visual, textual, auditory, and interactive elements. Therefore, the contribution of this study extends beyond confirming known learning style patterns, it provides empirical guidance for designing inclusive, technology-supported Arabic language curricula.

6. Conclusion and Implications

This study identified that learners of Arabic Language 1 primarily favour visual and reading/writing modes, indicating a reliance on visualized and text-based input when learning a non-Latin script. Rather than treating these findings as a simple typology of learning styles, this research interprets them as design insights for creating adaptive and technology-enhanced learning environments. When teachers leverage digital media such as infographics, interactive videos, AI pronunciation tools, and gamified role-plays they move beyond the limitations of fixed learning style models toward responsive and inclusive pedagogical design.

6.1 Pedagogical and Technological Implications

The findings suggest several practical recommendations for educators and curriculum designers:

- i. Integrate multimodal digital resources: Use visual–textual combinations (videos, interactive slides, online exercises) to enhance recognition and comprehension of Arabic orthography.
- ii. Adopt adaptive and micro-credential modules: Platforms like e-Kalam and e-Safar Sa‘īd can serve as flexible, learner-centred spaces that accommodate individual preferences and learning paces.
- iii. Enhance auditory and interactive engagement: Incorporate speech recognition tools, podcasts, and AI chatbots to build communicative fluency in more authentic digital contexts.
- iv. Design with UDL principles: Provide multiple means of representation (visual/audio/text), engagement (gamification, choice-based tasks), and expression (digital portfolios, dialogue simulations).

Through these strategies, learning style research can evolve from static profiling to evidence-based instructional design, helping educators respond to diverse learners in digitally mediated environments.

6.2 Limitations and Future Directions

Although the study’s descriptive design provided valuable insights, future research could explore how multimodal or adaptive digital instruction affects motivation, retention, and communicative competence among Arabic learners. Mixed-method or experimental designs may further clarify the causal relationship between preferred learning modes and actual performance outcomes. Expanding the sample to include learners from online or international programs can also uncover how cultural and technological exposure influences learning behaviour.

6.3 Conclusion

In conclusion, this study demonstrates that understanding learners’ modal preferences is not an end in itself but a means toward innovation in Arabic language pedagogy. By integrating insights from learning preferences into technology-enhanced and UDL-informed design, educators can move beyond traditional learning style models to create flexible, multimodal, and adaptive Arabic learning ecosystems that better serve the needs of 21st-century learners.

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