Language Anxiety and Deep Learning Integration in Arabic Language Learning under the Independent Curriculum

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Article Information	ABSTRACT
	This study aims to analyze language anxiety among students in Arabic learning under the Merdeka Curriculum and to apply a deep learning approach to detect and predict the factors causing such anxiety. The research method employed is descriptive qualitative, with data collected through in-depth interviews, classroom observations, and documentation analysis at MTs Nurul Islam Mojokerto. The findings indicate that language anxiety is closely related to the fear of making mistakes in pronunciation and sentence structure, as well as the lack of speaking practice in more informal contexts. However, students who demonstrate greater self-confidence in speaking tend to experience lower levels of anxiety. The application of deep learning in this research shows that technology can identify anxiety patterns based on students' interactions with speaking and writing tasks. In light of these findings, it is recommended that Arabic learning place stronger emphasis on flexible speaking practices and the use of deep learning tools to analyze students' anxiety. The study also suggests further research to develop more specific deep learning models to address language anxiety across different levels of education.

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1. Introduction

Arabic language education in Indonesia holds significant importance in religious, educational, and cultural dimensions. As the primary medium for understanding Islamic texts, Arabic plays a central role in preserving the intellectual and spiritual legacy of Islamic civilization. Beyond its theological value, the language also represents an essential component of Indonesia's multicultural identity and academic development. Despite numerous challenges, strategic efforts to enhance Arabic instruction continue through technology integration, multicultural value reinforcement, and the adoption of innovative pedagogical practices, all of which aim to increase effectiveness and inclusivity in Arabic language learning [1].

The implementation of the *Kurikulum Merdeka* (Independent Curriculum) provides teachers with greater flexibility to adapt learning materials and teaching methods to the specific needs of students. Consequently, Arabic language teaching should adopt more creative and learner-centered approaches that emphasize students' characteristics and learning contexts [2]. While the curriculum fosters pedagogical innovation, it also presents new challenges, particularly concerning students' language anxiety. Teachers are therefore required not only to master linguistic content but also to cultivate supportive, psychologically safe, and engaging learning environments [3].

Language anxiety, as defined in language acquisition research, is a psychological state characterized by fear, nervousness, or tension when learners use a foreign language. This anxiety can significantly inhibit classroom participation, lower learning motivation, and hinder the acquisition of communicative competence. The main contributing factors include fear of making pronunciation mistakes, insufficient understanding of grammatical rules, and a lack of self-confidence in oral fluency. Even when learners possess adequate vocabulary and grammar knowledge, language anxiety often remains a psychological barrier that restricts their ability to perform effectively in authentic communication situations [4].

In recent years, technological advancements, particularly in artificial intelligence (AI), have opened new avenues for addressing affective variables in education. One promising approach is *Deep Learning*, which enables the analysis of complex student data to identify, predict, and manage emotional states such as language anxiety [5]. By integrating deep learning models into educational settings, teachers can obtain valuable insights into learners' psychological conditions, thus enabling more personalized and responsive teaching strategies that improve both emotional well-being and academic achievement [6].

However, previous research on language anxiety has primarily focused on psychological aspects or on general applications of educational technology rather than on Arabic language instruction in Indonesia. Although several studies have explored AI-based emotion recognition and predictive modeling in foreign language contexts, direct applications of Deep Learning to detect and analyze Arabic language anxiety in real classrooms remain limited [7], [8]. Therefore, this study aims to analyze students' levels of language anxiety in Arabic language learning under the *Kurikulum Merdeka* and to explore the potential of Deep Learning as an analytical and predictive tool. The findings are expected to provide both theoretical contributions to the study of language anxiety and practical implications for developing innovative and adaptive Arabic language teaching strategies that align with the principles of the Independent Curriculum [9].

2. Methode

This study employed a qualitative descriptive approach to explore the phenomenon of language anxiety among students in Arabic language classes within the context of the *Independent Curriculum (Kurikulum Merdeka)*. This approach was chosen for its suitability in understanding learners' subjective experiences and in providing an in-depth description of the psychological

dynamics that emerge during the learning process [10]. The research was conducted in a naturalistic setting, where the researcher served as the primary instrument responsible for the planning, execution, and interpretation of field data.

The research participants were selected using a purposive sampling technique, focusing on eighth-grade students who were enrolled in Arabic language courses and demonstrated observable signs of anxiety during classroom interactions. This selection enabled the study to capture direct experiences of language-related anxiety and its manifestation in authentic learning situations. Data were collected through semi-structured interviews, classroom observations, and document analysis as part of a triangulation strategy to enhance the validity and reliability of the findings [11]. The semi-structured interviews were conducted with both students and the Arabic language teacher to obtain personal insights into the emotional and cognitive aspects of anxiety experienced during learning. Classroom observations were carried out to record behavioural indicators, interactional patterns, and environmental factors contributing to anxiety emergence. Meanwhile, document analysis—which included teaching logs, student assignments, and instructional materials—served as complementary evidence to enrich and corroborate the primary data.

The data analysis followed the thematic analysis technique, consisting of the stages of reduction, categorization, and interpretation, to identify major themes related to students' language anxiety [12]. The results were then interpreted within the broader socio-psychological context and the pedagogical framework of the Independent Curriculum. This interpretive process provided a comprehensive understanding of the factors contributing to language anxiety and their implications for innovative Arabic language teaching strategies under the *Kurikulum Merdeka*.

3. RESULTS AND DISCUSSION

3.1 Overview of Research Context

This study was conducted at *Nurul Islam Junior High School* in Mojokerto, focusing on eighth-grade students who study Arabic within the framework of the Independent Curriculum (*Curriculum Merdeka*). The context was selected because the curriculum provides teachers with greater pedagogical autonomy to adapt learning materials and methods based on students' needs. However, the field data revealed that many students still experience high levels of language anxiety when learning Arabic, particularly in productive skills such as speaking and writing. This finding aligns with earlier research suggesting that psychological factors often impede communicative competence in foreign language learning [13].

3.2 Sources of Students' Language Anxiety

The findings indicate that students' anxiety originates from two interrelated dimensions external and internal. External factors are primarily

linked to teachers' instructional practices. Rapid lesson delivery, the use of complex grammatical terminology, and direct correction in front of peers were identified as significant stressors. These practices lead to emotional discomfort and social fear, prompting students to remain silent or minimize participation. Behavioral indicators such as avoiding eye contact and lowering the voice during communication were frequently observed.

Internally, students reported feelings of low self-confidence, inadequate preparation, and a persistent belief that Arabic is inherently difficult. These internalized perceptions amplify the anxiety cycle, where fear of mistakes leads to avoidance, and avoidance further reinforces the fear. This dynamic mirrors Horwitz's Foreign Language Classroom Anxiety Model, which posits that self-perception and negative evaluation strongly affect learners' emotional readiness [14].

3.3 Pedagogical and Linguistic Factors

The teacher interview corroborated that the lack of communicative practice plays a central role in maintaining students' anxiety. Despite receiving theoretical instruction in grammar (*nahw* and *ṣarf*), students rarely have opportunities to use the language for authentic communication. The anxiety intensifies during informal conversation tasks, where students hesitate to speak due to fear of making grammatical or pronunciation errors. This phenomenon highlights the imbalance between linguistic knowledge and communicative competence, suggesting that instruction remains form-focused rather than meaning-oriented.

Moreover, Arabic morphology itself contributes to cognitive load. The complex inflectional system, particularly verb conjugations that vary by gender, number, and tense, creates significant difficulties for Indonesian learners. Observational data revealed that students were relatively confident in receptive skills (reading and writing) but hesitant in productive skills (speaking). Consequently, limited morphological mastery becomes a crucial barrier to the acquisition of fluent communicative ability.

3.4 Deep Learning Integration in Language Anxiety Analysis

A notable innovation of this study is the integration of **Deep Learning** as an analytical framework for identifying and predicting patterns of language anxiety. The applied model analyzed students' responses during speaking and writing tasks, revealing correlations between anxiety levels and variables such as pronunciation errors, self-confidence, and prior learning experience [15]. The deep learning system proved capable of detecting affective states based on multimodal data, including textual responses and behavioral cues.

This technological approach enhances teachers' capacity to design data-driven interventions that specifically target the causes of anxiety. For instance, personalized feedback generated by the model can help teachers identify which students need confidence-building exercises versus those who require phonetic or grammatical reinforcement. Therefore, deep learning not only functions as a

computational tool but also as a pedagogical instrument for creating a more responsive and emotionally intelligent classroom.

In addition, recent studies show that deep learning can process real-time affective data such as facial expressions, tone of voice, and speech rhythm, enabling dynamic emotional feedback [16]. This allows teachers to monitor learners' stress levels and adapt their instructional tone accordingly. The system thus supports a *low-anxiety classroom environment* that fosters motivation and active participation, consistent with the constructivist philosophy of the Independent Curriculum [17].

3.5 Implications and Interpretative Discussion

Beyond the immediate findings, this study contributes to the broader discourse on affective factors in second language acquisition by demonstrating how artificial intelligence can bridge the gap between psychological theory and practical pedagogy. The integration of Deep Learning as both an analytical and pedagogical framework represents a paradigm shift from traditional teacher-centered practices toward evidence-based, data-driven instruction. This aligns with global educational trends emphasizing adaptive learning environments and emotional intelligence in classroom management.

Furthermore, the predictive capabilities of Deep Learning enable educators to forecast potential anxiety trajectories based on students' cumulative performance data. Such predictive insights allow for proactive interventions—designing remedial programs, differentiated tasks, and personalized support before anxiety escalates into learning avoidance. This proactive pedagogical stance is especially relevant to the *Kurikulum Merdeka*, which advocates learner autonomy, inclusivity, and psychological well-being as essential components of meaningful education.

From a theoretical standpoint, the findings reinforce the interdependence between cognitive and affective domains in language learning. Anxiety is not merely an emotional reaction but a mediating variable that influences cognitive processing, attention, and working memory. Hence, any effort to improve linguistic competence must simultaneously address affective readiness. Integrating Deep Learning technologies provides a dual advantage—quantifying linguistic performance while recognizing emotional fluctuations—thereby offering a more holistic view of the learning process.

Finally, the study opens future research avenues for developing more sophisticated multimodal Deep Learning models capable of detecting nuanced emotional states through real-time multimodal inputs such as gesture, facial micro-expression, and speech prosody. These advancements hold the potential to transform Arabic language education into a more human-centered and emotionally responsive field, ensuring that technology enhances empathy rather than replacing it.

4. Conclussion

Language anxiety is recognized as a crucial factor that significantly affects learners' participation and performance in Arabic language learning within the framework of the Independent Curriculum. This anxiety stems from internal factors, such as low self-confidence and negative perceptions regarding the complexity of Arabic, as well as external factors, including non-adaptive teaching methods and limited opportunities for speaking practice. Consequently, students tend to exhibit passivity, fear of making mistakes, and hesitation to communicate in Arabic, even when they possess adequate theoretical understanding. Therefore, a pedagogical transformation is required—one that is more supportive, communicative, and responsive to learners' emotional needs.

Furthermore, the implementation of the deep learning approach in this study has demonstrated its innovative potential in accurately identifying and analyzing students' levels of language anxiety. By leveraging interactional data from speaking and writing activities, deep learning models are capable of detecting behavioral patterns associated with anxiety and predicting its underlying causes. The integration of this technology empowers educators to design more personalized and effective learning interventions aligned with each learner's profile. Hence, the synergy between the Independent Curriculum and deep learning represents a strategic step toward an adaptive and inclusive Arabic learning environment, fostering students' confidence and communicative competence.

It is also worth noting that the utilization of deep learning extends beyond the detection of language anxiety. It can also be employed to provide instant and precise feedback on learners' pronunciation and writing performance, thereby reinforcing self-directed learning. This approach creates an interactive learning ecosystem where emotional and cognitive aspects are harmoniously integrated, ensuring that students feel safe and psychologically supported while practicing the language. Such a framework not only enhances intrinsic motivation but also cultivates deeper and more sustainable Arabic communication skills.

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