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Deep Learning Approach for Arabic Vocabulary Mastery in the Digital Era

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Abstract

This research examines applying a deep learning approach in teaching Arabic vocabulary (mufradāt) by integrating three main pillars: mindful learning, meaningful learning, and joyful learning. The research explores how these principles can enhance Arabic vocabulary mastery through innovative technology-based strategies. Using the Integrative Literature Review (ILR) method, this study synthesizes relevant literature from indexed journals, academic books, and research reports published between 2020 and 2025. Data was collected from trusted academic databases such as Google Scholar, Crossref, and Scopus. After a rigorous selection process, 12 high-quality literature sources were analyzed to identify key themes, methodologies, and findings. The analysis process involved identifying the theoretical foundation, objectives, methodology, findings, and relevance of deep learning-based mufradāt instruction studies. Key findings from various sources were synthesized to formulate a conceptual instructional model that integrates deep learning principles to enhance the effectiveness of Arabic vocabulary learning. The results show that the deep learning approach improves Arabic vocabulary mastery by encouraging student engagement, contextual understanding, and emotional motivation. Mindful learning enhances focus and retention through reflective practices and multimedia tools. Meaningful learning strengthens long-term memory by connecting new vocabulary with prior knowledge and real-life contexts. Joyful learning increases motivation through gamification, interactive media (such as Duolingo, Kahoot!, and Educandy), and collaborative activities. However, limited technological infrastructure in remote areas can hinder implementation. In conclusion, the deep learning approach supported by mindful, meaningful, and joyful learning strategies offers a transformative framework for teaching Arabic vocabulary. Educators can create engaging, effective, and sustainable learning environments by leveraging technology and student-centered pedagogy.

Keywords Arabic Language; Deep Learning; Integrative Literature Review; Mufradāt; Technology.

INTRODUCTION

Language learning is an important aspect of education and has various challenges, especially when learning foreign languages such as Arabic. In recent years, innovative learning approaches have been in the spotlight, particularly the application of deep learning, which focuses on three main pillars: mindful learning, meaningful learning, and joyful learning. These three pillars aim to improve students' language skills and create a fun and meaningful learning experience (Eslit, 2023; Ulagammal & Ramesh, 2023). Vocabulary acquisition is a fundamental aspect of foreign language learning that positively impacts learning and communication development in that language and is essential for adequate and efficient communication. Furthermore, inadequate vocabulary knowledge can be a major obstacle to mastering the target language (Alahmadi & Foltz, 2020).

Mastering vocabulary, or mufradāt, is a crucial component of learning Arabic and provides several key benefits for learners. A strong vocabulary foundation significantly enhances comprehension of Arabic texts; the more words mastered, the easier it is to understand complex material. Additionally, vocabulary mastery expands speaking ability, allowing learners to express thoughts and feelings effectively (Hijriyah et al., 2024).

The challenges faced by teachers and students in learning Arabic mufradāt, according to Sultan in his research, are that many non-native learners lack motivation to learn Arabic, which negatively impacts the mastery of mufradāt and other language skills (Almelhes, 2024). Applying deep learning methods in Arabic language learning has become a popular topic of discussion. Previous research shows how mindful learning can increase students' attention and engagement in the learning process (Kuru Gönen, 2022). In this context, it is important to explore various techniques and strategies that support mindful learning, where students are guided to become more aware and focused on the material being studied. Research by Gönen shows that applying mindfulness practices in language teaching can help reduce stress and improve learning outcomes.

However, there is still room for further research on how this approach can be effectively applied to learning Arabic vocabulary. Therefore, this research formulates the concepts, methods, and implementation that can be used to apply the deep learning approach to learning Arabic vocabulary using a technological approach. Efforts to solve this problem focus on developing an integrative problem-solving approach, considering students' needs and backgrounds. One effective way is to integrate local culture and contextual knowledge, enhancing the relevance and connection of Arabic language learning (Al Farisi et al., 2024; Muharom Albantani & Madkur, 2018; Nurdiana

et al., 2023). Thus, this approach provides not only linguistic but also cultural aspects, enriching students' learning experience.

Several studies have discussed the use of deep learning in Arabic language learning in recent studies. The deep learning approach in Indonesian education is a worthy subject of research, supported by strong logical, theoretical, and empirical reasons. Logically, deep learning emphasizes meaningful, reflective, and enjoyable learning, encouraging students to deeply understand and apply concepts in real-life contexts rather than merely memorizing them (Sari & Arta, 2025). Theoretically, this approach is rooted in constructivist and active learning theories. It is supported by theoretical models such as Biggs' 3P model and Bloom's taxonomy, which highlight the importance of integrating cognitive, affective, and psychomotor domains in the learning process (Mystakidis, 2021). Empirically, systematic studies show that deep learning can significantly improve students' critical thinking, creativity, collaboration, and learning outcomes (Mystakidis, 2021). Meta-analytic studies have even found up to a 27% improvement in learning outcomes compared to conventional methods. Additionally, deep learning has proven effective in fostering intrinsic motivation, emotional well-being, and students' readiness to face 21st-century challenges. However, implementation challenges such as teacher readiness, infrastructure, and curriculum adaptation must be addressed to maximize its benefits (Sari & Arta, 2025). Therefore, research on deep learning is highly relevant to support the transformation of Indonesian education toward being more adaptive, innovative, and globally competitive.

Recent bibliometric analysis research shows increased publications in the last five years, indicating a growing interest in integrating AI and deep learning techniques in language education (Eslit, 2023; M Mohideen, 2024). Technology applications and local cultural knowledge can be a strategic tool for implementing deep and continuous learning in line with global developments (Alafnan, 2025). This literature review will provide a comprehensive theoretical framework for understanding how the deep learning approach can be applied in learning Arabic vocabulary. It will examine various existing strategies and how they can be adapted to achieve optimal results. The triggering research to explore these aspects includes at least ten references (Latifatul Inayati et al., 2021; Purba, 2022) focusing on understanding and practical application in the learning context. Active student involvement and emphasis on a learning environment that encourages positive experiences are the main focus in creating a learning atmosphere that inspires and motivates students to learn Arabic deeply and comprehensively.

Therefore, this research focuses on conducting an integrative literature review on how the concepts, methods, and implementation of learning based on the deep learning approach can support Arabic vocabulary learning. We also hope to explore this further with the hope of providing a meaningful contribution to the world of Arabic language education.

METHOD

This research uses an Integrative Literature Review (ILR) approach to explore and synthesize relevant literature in developing Arabic vocabulary learning based on deep learning. This approach was chosen because it is suitable for integrating relevant research findings to create a new perspective in Arabic language teaching. The ILR approach allows researchers to combine, critique, and synthesize existing literature, resulting in a new conceptual framework relevant to the research context (Torraco, 2005, 2016). In this study, the approach was applied to: (1) review the literature on mufradāt (vocabulary) learning as a foreign language teaching strategy, (2) examine the concept of the three pillars of deep learning in the context of learning that will be linked to Arabic mufradāt learning, (3) identify theories related to the process of Arabic mufradāt learning with the concept of the three pillars of deep learning, and (4) synthesize findings to formulate an integrative learning model that combines mufradāt learning with the concept of the three pillars of deep learning.

The data sources in this study came from scientific literature, including indexed journals, academic books, and research reports relevant to mufradāt (vocabulary) learning, the concept of the three pillars of deep learning, and Arabic mufradāt teaching. Literature was searched using the Publish or Perish application in trusted academic databases such as Google Scholar, Crossref, and Scopus. The search used keywords such as "mufradāt/arabic vocabulary in learning" and "deep learning in language learning." To ensure relevance, the time range of the literature was limited to the last five years (2020–2025). Both experimental and non-experimental studies were collected to provide an empirical and theoretical overview of the research theme.

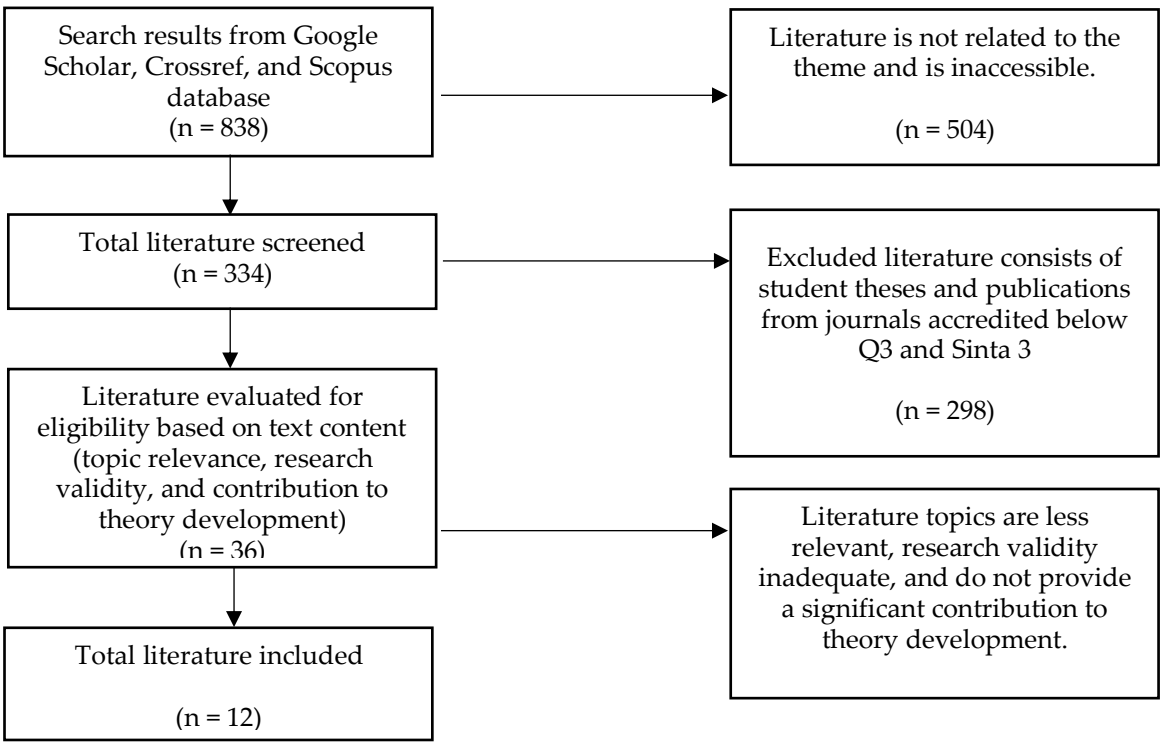
After the search process, 838 pieces of literature were obtained. Literature unrelated to deep learning and mufradāt learning was excluded, leaving 334 pieces of literature. The literature was then filtered based on exclusion criteria, namely: (1) literature in the form of academic theses or dissertations, (2) literature published in journals with a maximum accreditation of Q1 for international articles and a minimum of Sinta 3 for national articles. After the filtering process, 36 pieces of literature remained. Furthermore, the literature was selected based on eligibility criteria,

including topic relevance, research validity, and contribution to theory development. The selection process involved reviewing abstracts, methods, discussions, results, and interventions. Literature deemed irrelevant or of low quality was excluded from the analysis. A total of 12 pieces of literature were analyzed.

The literature that met the criteria was then classified into several main themes, namely: (1) the concept and implementation of Deep Learning in Arabic vocabulary learning, (2) the role of technology in developing Arabic vocabulary learning, (3) teaching Arabic vocabulary using a deep learning approach. The available data was analyzed critically and comprehensively by highlighting the strengths and main contributions of the available literature. The analysis process included (1) identifying and understanding the theoretical basis, research objectives, methodology, findings and results, research context, contributions, and relevance to studies related to Arabic vocabulary learning using a deep learning approach, (2) integrating key findings from various literature sources to develop an innovative learning model, (3) This synthesis resulted in a conceptual model that integrates deep learning principles with Arabic vocabulary learning. This model is designed to support Arabic vocabulary (mufradāt) learning more effectively.

To enhance the validity of the analysis results, this study used data triangulation through cross-comparison by comparing findings from various literature sources to ensure consistency of results.

Picture 1. Flowchart of the Literature Selection Process



FINDINGS AND DISCUSSION

Findings

Table 1. Integrative Literature Review Based on Deep Learning Pillars in Arabic Vocabulary Instruction

No	Author(s) & Year	Learning Pillar	Key Findings	Implications for Vocabulary Learning
1	Kuru Gönen (2022); Ulagammal & Ramesh (2023)	Mindful	Mindfulness improves focus and reduces anxiety	Use of reflective practices and learner awareness prior to vocabulary instruction
2	Hammad & Aberash (2024)	Mindful	Mindful learning fosters awareness in the learning process	Integration of reflection and observation using interactive media for vocabulary acquisition
3	Mariana & Hula (2024)	Mindful	Deep learning fosters a mindful learning environment	Encourages self-assessment and reflection in learning Arabic vocabulary
4	Hamida et al. (2022); Vallori (2014)	Meaningful	Linking new vocabulary to prior knowledge enhances retention	Activating prior knowledge and using local context in vocabulary instruction
5	Muhaimin & Thoms (2025)	Meaningful	Visual media enhances understanding and interest	Use of pictures and digital illustrations to associate words with meanings
6	Rizqia et al. (2024)	Meaningful	Mimicry memorization strengthens word comprehension	Use of movement and intonation for memorizing and applying vocabulary
7	Bahy et al. (2022); Nisa et al. (2024)	Meaningful	Repetition in real-life contexts supports application	Aural-oral techniques and contextualized vocabulary practice
8	Feriyanto & Anjariyah (2024); Ashari et al. (2023)	Joyful	Joyful learning boosts motivation and engagement	Language games, humor, and interactive classroom environments
9	Ritonga et al. (2022); Wijaya et al. (2023)	Joyful	Duolingo and gamification support autonomous learning	Application of AI-based learning apps for basic Arabic vocabulary
10	Rojabi et al. (2022)	Joyful	Kahoot improves engagement and test performance	Game-based quizzes tailored to Arabic vocabulary learning
11	Ilhami et al. (2022)	Joyful	Quizizz fosters a fun and interactive learning environment	Interactive vocabulary assessments through quizzes
12	Fitria & Roziqi (2022)	Joyful	Educandy enhances vocabulary comprehension through games	Use of web-based matching games and quizzes for vocabulary mastery

This table 1 summarizes the findings from various literature sources, categorized according to the three main learning pillars: mindful, meaningful, and joyful learning. Each pillar uniquely enriches the deep learning approach for mastering Arabic vocabulary. This table demonstrates that integrating the three learning pillars can strengthen the deep learning approach to mastering Arabic vocabulary in the digital era. Each pillar complements the others: Mindful supports mental readiness, Meaningful reinforces semantic connections, and Joyful enhances motivation and learning engagement. Combining these pillars can lead to more effective, sustainable, and relevant vocabulary learning experiences for modern learners.

Deep Learning as a Learning Approach

In November 2024, the Minister of Primary and Secondary Education (Mendikdasmen), Abdul Mu'ti, stated that there was an idea to replace the Merdeka Belajar curriculum with a new approach called Deep Learning. In his statement, he emphasized that Deep Learning aims to provide students with a more meaningful, enjoyable learning experience" in-depth (Erwina Rachmi Puspapertiwi, 2024). This concept focuses on three main elements: Mindful Learning, Meaningful Learning, and Joyful Learning, each leading to student engagement, the development of deep understanding, and satisfaction in the learning process (Putri et al., 2022).

Mindful learning emphasizes students' full awareness of the learning process, both emotionally and cognitively. Several studies show that applying mindfulness in language learning can reduce anxiety, increase concentration, and help students be more present in learning (Kuru Gönen, 2022; Ulagammal & Ramesh, 2023). Meaningful learning occurs when students can connect new material with existing knowledge. Vocabulary learning is often abstract, requiring a contextual approach to be more meaningful. Several studies suggest using folklore, daily conversations, and local cultural contexts as media to introduce vocabulary contextually (Albantani et al., 2023; Nurdiana et al., 2023).

Emotional aspects are crucial for successful language learning. Joyful learning involves fun activities stimulating creativity, such as gamification, interactive quizzes, songs, or role-playing. In a study by Eslit, using AI-based educational technology was proven to create a more engaging and actively participatory learning environment (Eslit, 2023). Deep learning in modern education is not limited to artificial intelligence (AI) technology but also includes deep learning methods for understanding and applying knowledge. This approach is oriented towards active, collaborative, and continuous learning. Students are encouraged to understand context, critically analyze

information, and create innovative solutions based on a strong conceptual understanding. Deep learning is a learning approach that provides experience for students. Students are not just filled with theoretical things; the deep learning approach leads to contextualizing knowledge. The theories students learn can be applied in real life (Adnyana, 2024).

Deep learning can strengthen student engagement in the learning process. However, these results are not always consistent in every school, depending on the readiness of available infrastructure and resources. In many schools in Indonesia, especially in remote areas, educational infrastructure is still a major obstacle to implementing this method. For example, access to adequate technological devices is very limited, which hinders the effectiveness of technology-based learning that is part of the deep learning model (Suwandi et al., 2024). Deep learning trains student independence while also training collaborative skills. Deep learning focuses on developing student self-confidence through group discussions, conducting experiments, and conducting research projects. In addition, students can reflect on what they have done. With this, students will know their shortcomings in learning. Through reflection, students can improve their competence so that learning achievements can be reached as expected (Adnyana, 2024).

The purpose of the deep learning curriculum approach is for students to understand concepts, principles, and values comprehensively so that they do not just memorize facts but can apply knowledge to solve complex problems, hone 21st-century competencies (communication, collaboration, and digital literacy), and form individuals who can reason independently, flexibly, and innovatively (Anhar et al., 2025). Continuing from the function, purpose, and meaning, some components in the deep learning curriculum include, first, learning objectives directed at developing higher-order thinking skills and their application, "second, the teaching materials are relevant to real life and involve cross-disciplinary integration, third is the learning methods used, namely project-based, problem-based, and collaborative learning methods, fourth is the assessment used, namely authentic evaluation, and fifth is the learning resources used, which utilize digital learning resources, interactive media, and the surrounding environment (Ghebrechristos & Alaghband, 2020; Tirkes et al., 2018).

Deep learning-based learning in basic education strengthens personalized learning, developing critical and reflective thinking skills, and meaningful student-centered learning supported by active, authentic, and collaborative values. It also considers the challenges of digital adaptation and the provision of relevant materials (Gufron & Rofi, 2024).

Therefore, it can be concluded from various explanations regarding Deep Learning that it is a new learning approach emphasizing meaningful, in-depth, and enjoyable learning experiences through mindful, meaningful, and joyful learning. Its focus is conceptual understanding, real-world application, collaboration, and student independence. Although potential, its implementation is constrained by infrastructure in remote areas. This curriculum aims to shape critical, innovative, and competent 21st-century students through contextual materials, project-based methods, authentic assessment, and utilizing digital resources and the surrounding environment.

The Role of Vocabulary in Arabic Language Learning

The role of vocabulary in Arabic language learning is the main foundation for helping students master the four language skills and a focus on improving learning at the basic level (Siregar et al., 2023). Good vocabulary mastery will help students understand the meaning of texts, construct sentences correctly, and improve communication skills in real contexts (Wan Daud et al., 2021). Vocabulary learning should involve real contexts, meaningful use, and interactive and collaborative approaches, especially online learning. Vocabulary taught contextually and through digital media has increased student understanding, engagement, and learning motivation (Solimando, 2022). Good vocabulary mastery is strongly correlated with success in understanding and using language effectively, both in oral and written contexts, and reading ability is greatly influenced by the breadth of vocabulary mastery, with the highest correlation among the four language skills (Alahmadi & Foltz, 2020)

Vocabulary is also closely related to learning strategies. The two main strategies are Lexical Inference (guessing meaning from context) and Lexical Translation (finding the meaning of words through a dictionary). The research by Alahmadi and Foltz found that the use of inference strategies was more successful in learning new vocabulary through context. Meanwhile, using a dictionary, although more directly accurate, does not always impact long-term retention (Alahmadi & Foltz, 2020). Vocabulary is a crucial aspect of language learning because, without vocabulary mastery, communication cannot be effective. In his research using mobile technology such as applications, gamification, and augmented reality, vocabulary learning becomes more interesting, flexible, and contextual (Okumuş Dağdeler, 2023).

Vocabulary teaching in language learning should be done through living linguistic contexts, not just through lists of words memorized without semantic connection. Presenting vocabulary in simple conversations or texts allows students to understand the meaning, usage, and nuances of

words naturally so that they can apply the vocabulary correctly in real communication situations, not just know it theoretically. Memorizing vocabulary without context only results in shallow understanding and does not build true language competence. Therefore, competent teachers need to equip students with active learning strategies, such as encouraging the recording of new vocabulary in meaningful sentences and clear contexts, to ensure that vocabulary mastery does not stop at recognizing meaning but develops into the ability to use it effectively in various communication situations (Al-Fauzan, 2015).

Discussion

Mindful, or mindfulness, comes from the Pali word sati, which means awareness and attention (Hammad Al-Rashidi & Aberash, 2024). In mindful learning, which fosters students' self-awareness in the learning process, techniques such as breathing exercises before learning, self-reflection, and personally relevant materials can increase student engagement. Educators can facilitate this through open-ended questions and activities that stimulate awareness of word meaning (Ajeng et al., 2025). Kabat-Zinn adds that mindfulness is the intentional and non-judgmental awareness of current sensory and cognitive experiences (Kabat-Zinn, 2003).

The deep learning approach is integrated into Arabic vocabulary learning so that learning develops further in the context of deep understanding and satisfaction in the learning process. In its concept, deep learning has three pillars: mindful learning, meaningful learning, and joyful learning. The mindful approach can significantly improve focus and attention in vocabulary learning, especially when combined with reflective strategies and interactive visual media. The research by Hammad & Aberash found that mindfulness language learning is described as an approach that emphasizes full awareness of the learning process with a focus on the present moment without judgment (Hammad Al-Rashidi & Aberash, 2024). Therefore, in this explanation, the mindful approach increases focus on vocabulary learning by emphasizing full awareness. Combined with reflection and visual media, it effectively supports understanding.

Mindfulness increases students' awareness of the learning process, mental readiness to learn, and integrating of thoughts and feelings in learning (Hammad Al-Rashidi & Aberash, 2024). Therefore, in this Arabic vocabulary learning, teachers need to instill in students the awareness of learning Arabic vocabulary as a necessary tool for speaking and communicating. The steps that can be taken for Arabic vocabulary learning with a deep learning approach to the mindful concept are as follows (Gharawi & Bidin, 2016; Mayer, 2002).

1. The objective is to focus on mastering thematic vocabulary deeply and meaningfully.
2. Preparing materials involves creating a complete vocabulary dataset (word, meaning, image, sound, example sentence).
3. The mindfulness approach invites students to learn consciously, focus, and calmly, slowly observing vocabulary pronunciation, meaning, and usage.
4. Deep Learning integration uses AI technology (e.g., speech or text recognition) to assist in adaptive and interactive vocabulary practice.
5. Learning activities include sentence construction, picture guessing, or interactive chatbots.
6. Evaluation and feedback involve using AI to evaluate and invite students to reflect on their learning automatically.
7. Reinforcement and reflection, which involves providing time to reflect on meaningful vocabulary and repeat it consciously.

The concept of mindful learning in Arabic vocabulary emphasizes students' full awareness of the learning process, including self-reflection, monitoring learning progress, and focusing on relevant material. Based on previous research conducted at Pondok Pesantren al-Islam, the Deep Learning approach successfully created a mindful learning environment where students showed awareness of the learning steps, were able to reflect on their learning experiences, and identified strengths and weaknesses in understanding Arabic vocabulary. The average score on the mindful aspect showed a high value, such as awareness of the learning process, reflection on experience, and focus on learning, which indicates that students become more mentally and emotionally involved in the vocabulary acquisition process (Mariana & Hula, 2024).

Thus, mindful learning plays an important role in improving the quality of Arabic language learning, as students do not just memorize vocabulary but also understand the context of its use consciously and reflectively. The deep learning approach in Arabic vocabulary learning yields better results than conventional methods. Through collaboration, interactive technology, and high cognitive engagement, students can develop a deeper and more applicable understanding of vocabulary.

The involvement of interactive technology in learning, especially Arabic vocabulary, is very important to create enjoyable and meaningful learning. Duolingo is an application that is already available and can support Arabic language learning, especially vocabulary. According to Ritonga et al., using the Duolingo application as a platform for learning Arabic, especially for adult learners

(andragogy). Duolingo provides gamification features, images, and audio that strengthen independent vocabulary learning. Although more suitable for beginner learners, this platform has proven effective in helping users master basic Arabic vocabulary in a fun and flexible way, in line with the principles of deep learning, which require active engagement and independent exploration in language learning (Ritonga et al., 2022).

Etymologically, the term meaningful learning comes from two words in English: meaningful and learning. The word meaningful consists of meaning, which means "meaning" or "sense," and the suffix -ful, which means "full." Thus, meaning can be interpreted as "full of meaning" or "meaningful." Meanwhile, learning comes from the verb to learn, which means "to study." In noun form, it means "the process of acquiring knowledge, skills, or attitudes through experience or teaching." So, etymologically, meaningful learning can be interpreted as a learning process that contains deep meaning or significance for students (Vallori, 2014).

David Ausubel stated that meaningful learning is a process where new information is logically and relevantly linked to concepts or knowledge that students already possess in their cognitive structure. In other words, learning is not just memorizing information but connecting new concepts with existing experiences or knowledge so that the material becomes easier to understand and lasts longer in students' memory (Hamida et al., 2022). According to David, for learning to be meaningful, two conditions are required: (1) The learning material must be potentially meaningful, i.e., logical, relevant, and by the student's cognitive structure (2) Students must have the intention and readiness for meaningful learning, not just memorization (Hamida et al., 2022).

One effective, meaningful approach to learning this vocabulary is using visual media, such as pictures, flashcards, and digital illustrations, which can help students associate words with concrete representations. Research shows that visual media can improve memory retention, learning interest, and students' communication skills in Arabic, as it helps form strong associations between words and images (Muhaimin & Thoms, 2025). In addition, the mimicry memorization method, where students imitate and repeat vocabulary with appropriate movements and intonation, has also proven effective in strengthening the connection between words, meanings, and their use in sentences. With active student involvement through imitation and repetition accompanied by visualization, the learning process becomes more enjoyable and memorable and encourages continuous vocabulary mastery (Rizqia et al., 2024). This approach reinforces the principle that vocabulary mastery will be optimal if students understand the function, meaning, and use of words

in real contexts, not just memorizing them without meaning.

Integrating local content and activities relevant to students' lives effectively increases vocabulary retention and understanding. This also supports the principle of long-term learning transfer. Therefore, here are the steps that can be taken to learn Arabic vocabulary with a deep learning approach based on meaningful concepts.

Initial Construction and Prior Knowledge Activation. Start learning by connecting new vocabulary with students' existing experiences or vocabulary. This is important for building conceptual anchors so that new vocabulary is meaningful. For example, the teacher can show pictures, videos, or contextual stories. Evidence shows that connecting vocabulary with real contexts increases students' understanding and retention (Bahy et al., 2022).

Vocabulary Presentation with Multimodal Media (Visual, Audio, Movement). Use visual media (pictures, flashcards, mobile applications), audio (native speaker pronunciation), and kinesthetic (movement/body) so that learning involves multiple senses (multisensory). AI and deep learning-based applications, such as image recognition (CNN), help students learn vocabulary interactively and contextually through educational games based on smartphone cameras.

Contextual and Aural-Oral Repetition Practice (Meaningful Repetition). Repeat vocabulary through the Aural-Oral Approach technique where students listen, imitate, and use vocabulary in meaningful sentences, not just memorizing word lists. This approach has been proven to increase vocabulary mastery because it trains understanding and oral production in real contexts (Nisa et al., 2024).

Reinforcement Through Meaningful Activities (Meaningful Application). Involve students in activities that require active use of vocabulary: dialogues, vocabulary card games, role play, scavenger hunts, or writing short stories. Activities such as Make A Match or vocabulary card games have been proven to increase student engagement and vocabulary mastery significantly (Suhartono et al., 2016; Suwardi et al., 2023).

Reflection, Feedback, and Memory Reinforcement (Reflection and Feedback). Provide direct feedback and invite students to reflect on their understanding through discussions, interactive quizzes, or creating mind maps of new vocabulary. Research shows that reflection and reinforcement with mobile applications and digital media increase the connection of meaning and long-term retention (Chamidah et al., 2023). These steps build a meaningful connection between vocabulary and students' experiences, strengthen long-term memory, and improve the contextual

application of vocabulary.

Joyful learning in the context of technology provides a great opportunity to overcome boredom in vocabulary learning. The use of interactive applications, animations, or educational games is very helpful in increasing student engagement. As explained by Feriyanto, Joyful learning is a learning approach oriented toward students' happiness while learning. The goal is to create a fun and non-boring learning atmosphere so that students can be more active, creative, and involved in the learning process. Joyful learning involves play, humor, and a positive atmosphere that makes students feel comfortable, making them more likely to accept the material and be motivated to learn (Feriyanto & Anjariyah, 2024). Applying the joyful learning approach in Arabic vocabulary learning has been proven to create a more enjoyable and effective learning atmosphere for students. This strategy emphasizes a joyful learning experience through interactive and participatory activities so that students do not just passively receive material but are also actively involved in the learning process.

Joyful learning is applied through various methods such as language games, visual media, songs, and group work that encourage students' emotional and cognitive involvement. This approach helps students understand the meaning of vocabulary better and increases their motivation and interest in learning Arabic (Feriyanto & Anjariyah, 2024). Joyful learning methods like interactive games, quizzes, and project-based learning techniques can also create a fun and conducive atmosphere. This has a direct impact on improving vocabulary comprehension and strengthening students' memory of the words they have learned (Ashari et al., 2023).

This joyful learning approach is oriented towards cognitive outcomes and considers students' affective and emotional aspects in the learning process. Integrating technology, such as digital media and interactive applications, is important in creating a joyful and meaningful learning atmosphere. Research shows that applications such as Kalimaty, Duolingo, and Memrise are effective in facilitating vocabulary learning through game features, visualization, and reinforcement through interactive quizzes and fun daily challenges (Wijaya et al., 2023)

In addition, platforms such as Wordwall, Kahoot!, and Quizizz have also been proven to support competitive, collaborative learning, which can foster students' intrinsic motivation and enthusiasm for learning. This approach is in line with the principles of 21st-century learning, which places students at the center of learning and integrates cognitive, affective, and psychomotor elements in a fun and meaningful atmosphere (Wijaya et al., 2023).

Based on research by Rojabi et al., it is proven that Kahoot is effective in improving vocabulary learning outcomes, engagement, and motivation. For Arabic vocabulary learning, Kahoot can be adapted by considering the characteristics of the Arabic language (emphasis on pronunciation/writing) and technical challenges (such as internet connection). With the right design, Kahoot has the potential to be a fun and effective gamification tool (Rojabi et al., 2022). The Quizizz platform has several advantages that can help teachers and students in the learning process, such as creating a fun learning atmosphere and being easy to use (Ilhami et al., 2022).

In Arabic vocabulary learning through the joyful learning approach, gamification can also be done using web education. Educandy is an interesting and educational interactive game platform based on the web and applications. The Educandy platform provides games presented in the form of various quizzes. This platform offers a variety of fun games and is divided into three core game features: words, matching pairs, and quiz questions. This platform has also been proven to improve Arabic vocabulary comprehension (Fitria & Roziqi, 2022).

The research by Fitria and Roziqi found that students felt happy and enthusiastic during the learning process because their interest in the Educandy platform was quite high. This was known from the results of the questionnaire distributed regarding the Educandy platform used in the learning process (Fitria & Roziqi, 2022).

CONCLUSION

Based on the discussion above, the deep learning approach to learning Arabic vocabulary offers a more meaningful, in-depth, and enjoyable learning experience through three main pillars: Mindful Learning, Meaningful Learning, and Joyful Learning. Mindful learning helps students increase awareness and focus in learning vocabulary, reduce anxiety, and strengthen understanding through reflection and interactive media such as AI-based applications (Duolingo, voice recognition). Meaningful learning emphasizes contextual learning by linking new vocabulary to prior knowledge, using visual media and multimodal activities, and applying it to real-life situations. This approach enhances long-term retention and deep understanding of vocabulary. Joyful learning creates a fun learning atmosphere through gamification (Kahoot, Quizizz, Educandy), songs, role-playing, and interactive technology. This increases motivation and student engagement and strengthens vocabulary memory. Although the Deep Learning approach has great potential in improving Arabic language learning, challenges such as limited digital infrastructure in

remote areas and teacher readiness in implementing this method still need to be considered. With technology optimization, teacher training, and the development of relevant materials, this approach can shape students who are critical, collaborative, creative, and able to apply Arabic vocabulary in real life by the demands of 21st-century competencies. Thus, integrating Deep Learning into learning Arabic vocabulary not only enriches vocabulary mastery but also builds a holistic, active, and memorable learning experience for students.

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