



INTERACTIVE TEACHING MATERIALS FOR ARABIC LANGUAGE RULES BASED ON CONCEPT MAPS

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Abstract

Interactive teaching materials based on concept maps provide an alternative method of learning a language by combining the precision of edge organization with learning activities and feedback. The present article looks at the theoretical basis, features, past research, and areas that require further investigation concerning the use of concept map-based interactive teaching materials for learning Arabic rules, in particular nahwu and sharaf. The study was carried out by means of a conceptual and comparative analysis of the relevant literature on interactive teaching materials, concept maps, meaningful learning, constructivism, and language learning. The findings indicate that concept maps can assist students in understanding the hierarchy and the relationships between the rules; at the same time, the interactivity enables students to apply these concepts through grammatical analysis exercises, navigation of the material, evaluation, and receiving feedback. Meaningful learning theory and constructivism form the basis for explaining how students link new knowledge with their existing knowledge and develop their understanding as a result of the learning activities. Previous research also demonstrates the potential of concept maps in supporting learners' achievement in language learning, although the results are affected by context, format, and the way in which the students are involved. The literature review revealed research gaps regarding the integration of concept maps, nahwu and sharaf materials, interactive activities, and user experience into a single, coherent teaching resource. Hence, further qualitative research is required in order to examine the design features, the organization of the material, its ease of use, the limitations it has, and how students interpret the teaching materials. This study is intended to offer a conceptual basis for the development of Arabic language teaching materials that are more structured, interactive, and suited to the learning needs of higher education.

Keywords Interactive teaching materials; Arabic rules; Concept map

مستخلص البحث

توفر المواد التعليمية التفاعلية المبنية على خرائط المفاهيم طريقة بديلة لتعلم اللغة من خلال الجمع بين دقة التنظيم الحواف والأنشطة التعليمية والتغذية الراجعة. تتناول المقالة الحالية الأساس النظري، والخصائص، والأبحاث السابقة، والمجالات التي تتطلب مزيداً من التحقيق فيما يتعلق باستخدام مواد التدريس التفاعلية المعتمدة على خرائط المفاهيم لتعلم قواعد اللغة العربية، وخاصة النحوي والشرف. أجريت الدراسة من خلال

تحليل مفاهيمي ومقارن للأدبيات ذات الصلة حول مواد التدريس التفاعلية، وخرائط المفاهيم، والتعلم المعنى، والبنائية، وتعلم اللغة. تشير النتائج إلى أن خرائط المفاهيم يمكن أن تساعد الطلاب على فهم التسلسل الهرمي والعلاقات بين القواعد؛ وفي الوقت نفسه، تمكن التفاعلية الطلاب من تطبيق هذه المفاهيم من خلال تمارين التحليل النحوي، والتنقل في المادة، والتقييم، وتلقي الملاحظات. تشكل نظرية التعلم الهادف والبنائية الأساس لشرح كيفية ربط الطلاب بالمعرفة الجديدة بمعرفتهم الحالية وتطوير فهمهم نتيجة للأنشطة التعليمية. تظهر الأبحاث السابقة أيضا إمكانات خرائط المفاهيم في دعم إنجاز المتعلمين في تعلم اللغة، رغم أن النتائج تتأثر بالسياق والشكل وطريقة مشاركة الطلاب. كشفت مراجعة الأدبيات عن فجوات بحثية تتعلق بدمج خرائط المفاهيم، ومواد الهوية والشرف، والأنشطة التفاعلية، وتجربة المستخدم في مورد تعليمي واحد متماسك. لذا، هناك حاجة إلى المزيد من البحث النوعي لفحص ميزات التصميم، وتنظيم المادة، وسهولة استخدامها، والقيود التي تعاني منها، وكيفية تفسير الطلاب للمواد التعليمية. تهدف هذه الدراسة إلى تقديم أساس مفاهيمي لتطوير مواد تدريس اللغة العربية تكون أكثر تنظيما وتفاعلية وملاءمة لاحتياجات التعلم في التعليم العالي.

مواد تعليمية تفاعلية؛ قواعد اللغة العربية؛ خريطة مفاهيمية

كلمات أساسية

Introduction

Interactive teaching materials on Arabic grammar rules, based on concept maps, combine the development of the teaching materials, interactivity, the learning of the language rules (qawā'id al-lughah al-'Arabiyyah), and the use of visual representations to show the relationships between concepts (Saputra et al., 2026). The four elements reinforce one another in order to create a well-organized and meaningful learning experience. The teaching materials offer the content, examples, exercises, and assessments; interactivity allows students to respond to the material and get feedback; and the concept maps illustrate the hierarchy and the interconnected nature of the principles (Nur et al., 2024; Irfan et al., 2026; Fauzan, 2025). In the case of learning Arabic, this integration is important since the nahwu and sharaf materials contain not only declarative knowledge in the form of definitions and rule statements, but also procedural knowledge in the form of the ability to analyze sentence structures, identify word patterns, and apply the rules in accordance with the context. Hence, the interactive teaching materials based on concept maps in this study are seen as learning resources that integrate linguistic material, visual representations, learning activities, application exercises, and evaluation into an interconnected structure.

In principle, the creation of teaching materials can be guided by the theory of meaningful learning and by constructivist views. Meaningful learning involves linking new knowledge to the knowledge that students already have. Concept maps can help achieve this by clearly showing the main concepts, the supporting concepts, and the relationships between them. De Ries et al. (2022), in their literature review of open concept maps as a research tool for knowledge and learning, point out the value of concept maps when it comes to examining how knowledge is organised and the learning processes involved. From a constructivist point of view, knowledge is not simply transmitted by teachers to students, but is the result of individuals interpreting, connecting, testing, and revising their understanding. Hence, concept maps included in teaching materials on Arabic language rules should not merely act as a visual summary provided by the developers, but also function as a tool enabling students to investigate the relationships between the rules, compare examples, and give the grammatical reasons for a particular language form.

Interactivity goes beyond simply providing information and instead involves students in the learning process. Here, interactivity means including activities which allow students to respond to the material, choose or open particular sections, do some exercises, check their answers, and get feedback that helps them to better understand the subject. Therefore, the fact that a teaching resource is digital does not mean that it is interactive. It is necessary for teaching materials to be designed in such a way that students' interactions have a clear educational aim and are directly linked to the learning objectives (Sukmawati et al., 2025; Haryono et al., 2026; Widodo et al., 2025; Fauzan, 2026; Fauzan et al. 2025). For instance, in nahwu learning students are able to identify the function of words in sentences, connect these functions with the relevant rules, and then verify the accuracy of their analysis by means of feedback. In the case of sharaf learning, students can investigate the relationships between root words, formation patterns, and changes in meaning. The interaction in this way links up the conceptual representation with the application of the rules, so that students do not merely learn the terms but instead apply their knowledge when carrying out language tasks.

Concept maps are graphical representations which illustrate concepts and the meaningful relationships between them. In the context of this study, a concept map consists of main concepts, derivative concepts, material hierarchies, lines or links, and connecting words which explain the relationships between the concepts. This kind of structure sets concept maps apart from material lists, paragraph summaries, and charts that merely display the sequence of steps. In Arabic language teaching materials, the main concept may involve a discussion of sentence types or word categories, and the derivative concepts may include types, functions, characteristics, patterns, and examples of their use (Negoro et al., 2018; Dungir et al., 2022; Fauzan & Asrori, 2026). The relationships between these concepts have to be both grammatically correct and logically explained. Tu et al. (2022) indicate that concept maps have been employed in a variety of technology-assisted learning situations to help with knowledge organisation and learning activities. These findings support the use of concept maps as pedagogical tools. Yet their application still has to take into account the characteristics of the material and the needs of the learners. Therefore, the success of concept map design relies not only on its visual appeal but also on the accuracy of the knowledge structure and the readability of the relationships shown.

When preparing interactive teaching materials on Arabic grammar based on concept maps, it is important to take into account the material characteristics (Basmala et al., 2026; Nasrullah et al., 2025; Fauzan et al, 2022). Nahwu deals with the functions of words and the syntactic relationships involved in sentence construction, whereas sharaf relates to word formation, morphological patterns, and the changes in form associated with meaning and linguistic functions. The two fields are complementary, but they have analytical units and patterns of conceptual relationship that are not always the same. It is therefore necessary to consider, in the organisation of the material, the structure of each science, the relationships between topics, the level of complexity and the order in which the material is learned. For instance, a nahwu concept map can show the relationships between sentence elements, syntactic functions, and i'rab signs.

On the other hand, a sharaf concept map is able to show the relationships existing between word roots, wazan, derivative forms, and their possible meanings (Fauzan et al., 2026; Fauzan et al., 2025). Examples and exercises should be included as a link between the abstract concepts and the actual use of the language. Accordingly, effective interactive teaching materials involve not only the combination of text, images, and questions, but also

943 Fauzan, *Interactive Teaching Materials for Arabic Rules Based on Concept Maps*
the establishment of coherence among the substance of the rules, the visual structure, the learning activities, and the evaluation.

On the basis of this synthesis, the interactive teaching materials on Arabic grammar rules using concept maps in the present study are seen as a learning system that combines material accuracy, the organization of knowledge, pedagogical interaction, and user experience. Material accuracy involves the validity of the concepts and the examples given on nahwu and sharaf; the organization of knowledge refers to the hierarchy and the relationships between the rules; pedagogical interaction consists of the activities, exercises, and feedback; and user experience encompasses readability, the ease of navigation, and the students' perception of the usefulness of the teaching materials. These four dimensions provide the foundation for analysing how the teaching materials are designed, how their various elements are linked together, and how they are used in the learning context. Within the framework of qualitative research, these dimensions act as sensitizing concepts, serving as starting guidelines for data collection and interpretation without excluding the possibility of new themes emerging from the participants' experiences.

Six Subchapters of Literature Review

1. The Essence of Interactive Teaching Materials in Arabic Language Learning

Teaching materials are learning components that function to help teachers convey the substance of the material while providing guidance for students in achieving learning goals. In the context of learning Arabic, teaching materials include a description of rules, examples of use, exercises, summaries, and evaluations designed based on learning outcomes. Interactive teaching materials have additional characteristics, namely providing opportunities for students to interact with content through activities that demand response, decision-making, task completion, and reflection on learning outcomes.

Interactivity needs to be distinguished from simply presenting material in digital format. Electronic books that only move printed text to a screen do not necessarily offer adequate pedagogical interaction. On the other hand, teaching materials that combine explanation of rules with analysis exercises, cross-concept navigation, feedback, and concept map preparation activities can provide a more active learning experience. In an operational sense, the interactive teaching materials of Arabic rules in this study are studied based on four characteristics: (1) the clarity and accuracy of the material; (2) the integration of texts, visualisations, and examples; (3) the availability of activities and feedback; and (4) the ease of use for independent and guided learning.

The study by Chang et al. (2022) shows that learning supported by concept maps develops in various forms, including collaborative learning and technology-assisted learning. The study also shows that previous studies focused a lot on student performance, perception, and motivation. These findings provide a basis for understanding that the quality of interactive teaching materials needs to be seen from the relationship between learning design and user activities, not just the form of the media.

Thus, interactive teaching materials on Arabic rules need to be positioned as a pedagogical tool that connects grammatical knowledge with its application activities. In nahwu learning, interaction can be in the form of identifying word functions and analysing sentence structure. In sharaf learning, interaction can be in the form of recognising word patterns, analysing changes in shape, and tracing the relationship between form and

meaning. These two types of activities need to be arranged gradually so that students can develop conceptual understanding as well as skills in applying rules.

2. Concept Map as a Representation of Language Knowledge

Concept maps are visual representations that show meaningful relationships between concepts through hierarchical arrangements and connecting words. In learning, concept maps help display knowledge structures that may be difficult to understand when presented as a separate list of definitions or descriptions. De Ries et al. (2022) examined open concept maps as an instrument for understanding knowledge and learning. The study shows the relevance of concept maps in examining knowledge organisation and the way students' understanding is represented.

In learning Arabic rules, concept maps can be developed by placing the main topic at the centre of the material organisation, then connecting it with categories, characteristics, functions, patterns, and examples. As an illustration, the discussion of al-kalimah can be related to *ism*, *fi'l*, and *ḥarf*. Furthermore, the concept of *ism* can be related to classifications based on quantity, type, definiteness, and certain functions according to the scope of the material. The relationship needs to be designed based on the scientific structure of the Arabic language, not solely based on the ease of drawing charts.

Concept maps can also help show the relationship between declarative knowledge and the application of rules. The definition of *fā'il*, for example, can be linked to its position in a sentence, relevant *i'rab* signs, and examples of its use. In *sharaf*, the concept of *fi'il* can be linked to the form of *mujarrad* and *mazīd*, patterns of formation, and possible changes in meaning. These visual relationships allow students to explore the relationships between concepts while comparing their characteristics.

Han (2025), through a meta-analysis of 68 second language learning studies published in the 2006–2024 period, reported the positive influence of concept maps on overall language learning outcomes. The study also showed that the format of concept maps and the form of student involvement can be related to variations in research results. Although the results of the meta-analysis cannot be directly generalised to all Arabic language rules material, his findings provide empirical support for the study of concept maps as a tool for organising language knowledge.

Based on this description, the concept map in this study was analysed through the accuracy of the hierarchy, the clarity of the relationship between concepts, the use of connecting words, the suitability of examples, and the ease of information searching. These five aspects are the basis for assessing whether the visualisation used really represents the structure of linguistic knowledge or only functions as a decorative summary.

3. Characteristics of Arabic Rules: Nahwu and Sharaf

Arabic rules include a system of rules that describe sentence structure and word formation. *Nahwu* focuses on syntactic relationships, sentence element functions, and word-end changes according to their position in a particular construction. *Sharaf* focuses on the internal structure of words, formation patterns, shape changes, and the relationship between form and meaning. Although they have different focuses, they complement each other in supporting students' ability to understand texts and use Arabic appropriately.

The characteristics of the material require the organisation of teaching materials that considers the relationship between concepts and the stages of mastery. In *nahwu*, students need to relate the meaning of a syntactic function to the characteristics, positions, signs of *i'rab*, and examples of its use. In *sharaf*, students need to understand the relationship between basic forms, patterns, formation processes, and meanings. If these concepts are

presented without a clear relationship, students risk mastering definitions separately without understanding their use in the linguistic context.

The research by Solekhudin et al. (2023) examined the use of concept maps sourced from the book *Sharḥ Qaṭr al-Nadā wa-Ball al-Ṣadā* in nahwu learning among first-year students at UIN Walisongo Semarang. The study used a quasi-experimental design with one group and measurements before and after learning. The results showed an increase in the average score from 44.44 to 75.11. These findings show the potential use of concept maps in nahwu learning, but the research design mainly answers questions about changes in learning outcomes, not students' experience in using interactive teaching materials as a whole.

Therefore, interactive teaching materials based on concept maps need to pay attention to the compatibility between the structure of visual representation and the characteristics of the rules studied. The presentation of nahwu and sharaf does not have to use identical visual patterns because the conceptual relationships in the two fields are different. The development of teaching materials needs to be based on the analysis of substance, learning sequences, authentic examples, and exercises that encourage students to connect knowledge with application.

4. Meaningful Learning, Constructivism, and Interactivity

Meaningful learning provides a foundation for explaining the importance of the relationship between new knowledge and knowledge that students already have (Fatmawaty et al., 2024; Habibah et al., 2026). In learning Arabic rules, students not only need to remember definitions, but also relate them to previous concepts, recognise patterns in examples, and use them to analyse language structures. Concept maps can support this process by explicitly showing conceptual relationships, while interactive activities provide opportunities for students to test their understanding.

The constructivist perspective emphasises that understanding develops through the activity of building, testing, and revising knowledge (Azzahra et al., 2025; Fuad et al., 2026). Based on this perspective, students are not positioned as passive recipients of information, but rather as participants who develop understanding through observation, reasoning, discussion, and application of rules. Concept map-based teaching materials can provide an initial structure, but learning becomes more constructive when students are also given the opportunity to construct relationships between concepts, correct misclassifications, and explain the reasons behind their grammatical choices.

The study by Chang et al. (2022) identified two main theme groups in learning research supported by concept maps, namely knowledge construction through collaborative learning and concept map-based learning design to support learning outcomes and motivation. Meanwhile, Han (2025) reported that the collaborative use of concept maps tended to provide better results than individual use in the context of language learning analysed. Both studies support the possibility of integrating individual and collaborative activities in Arabic language teaching materials, while still considering the context and learning objectives.

Practically, the principles of meaningful learning and constructivism can be applied through several activities. Students first identify initial knowledge, study concept maps, observe examples, work on exercises, discuss the relationships between rules, and reflect on the results of the analysis. Teachers play the role of providing explanations and feedback when students face difficulties. Thus, concept maps function as cognitive scaffolds, while

interactivity functions as a mechanism that allows students to use and evaluate the knowledge learned.

5. Relevant Previous Research

Previous research provides an empirical basis for understanding the use of concept maps in language learning, especially in learning Arabic language rules. The following studies were selected based on their relevance to concept maps, the development of teaching materials, and the use of qualitative approaches. These studies have different focuses and methods, so it is necessary to compare them critically to determine the position of the research being developed.

a. Rauf and Mufidah (2021)

The research entitled *The Use of Concept Map Teaching Materials to Improve Mastery of Jurumiyah Mapel in the Online Learning Process* aims to increase the mastery of the Jurumiyah nahwu concept in students. The research uses a qualitative approach with a classroom action research design. The results show an increase in average mastery from 67 in the first cycle to 77 in the second cycle, accompanied by an increase in activity and motivation to learn. The relevance lies in the use of concept maps as part of nahwu teaching materials. The difference is that the research is oriented towards improving online learning at the madrasah level, while this study focuses on the characteristics of interactive teaching materials and the experience of using them.

b. Solekhuudin et al. (2023)

This study evaluates the use of concept maps from the book *Sharḥ Qaṭr al-Nadā wa-Ball al-Ṣadā* in nahwu learning in Islamic universities. With a quasi-experimental design of one group, the study found an increase in the average score from 44.44 to 75.11. The relevance lies in the application of concept maps for nahwu materials in higher education. The difference is that the study emphasises changes in learning outcomes, while this study is directed to explore the organisation of materials, interactivity, and the meaning of teaching materials in the context of learning.

c. Anwar (2024)

The research on the *Implementation of the Concept Map Method in Sharaf Learning* uses a qualitative descriptive method in Arabic Language Education students of UIN Maulana Malik Ibrahim Malang. The concept map is used as a summary of student learning outcomes, which then becomes the subject of discussion in class. The research found that the method helps students understand the material, increase creativity and discipline, and face obstacles in the form of differences in educational background and seriousness in completing assignments. This research is closest to the approach used in the study of interactive teaching materials because it describes the learning process and obstacles. The difference is that Anwar's object is the implementation of the concept map method by students, while this research focuses on teaching materials that integrate concept maps and interactive features.

d. Ta and Razali (2023)

Through a systematic review of 33 studies, this study examines the use of concept maps in learning second language reading comprehension. The results show that concept maps are used at the stage before reading, during reading, and after reading as knowledge organisers, learning media, as well as summoning and evaluation tools. Their relevance lies in the function of concept maps that can be adjusted to the learning stages. However, the

e. Chang et al. (2022)

This study examines the roles, applications, and learning trends supported by concept maps through systematic review and bibliometric analysis. The results identify the construction of knowledge in collaborative learning as well as learning design to support achievement and motivation as the two main theme groups. This study is relevant as a foundation for connecting concept maps with the design of teaching materials and learning activities. However, the scope is cross-field and does not specifically examine interactive teaching materials on Arabic rules.

f. Han (2025)

This meta-analysis combines 68 studies on concept maps in second language learning published in 2006–2024. The results show an overall positive influence on language learning outcomes, with variations based on concept map format, context, and form of implementation. The study provides empirical support for the use of concept maps, while demonstrating the need to consider the learning context. In contrast, this study combines quantitative results across studies, while the study of Arabic language teaching materials seeks to understand the process, design characteristics, and user experience contextually.

Overall, previous research shows that concept maps have been used as teaching materials, learning strategies, visualisation tools, and instruments to organise knowledge. National research provides an overview of its implementation in nahwu and sharaf learning, while international studies show the development of the use of concept maps in language learning and educational technology. The differences in objects, educational levels, and research methods are the basis for determining the focus of a more specific study on interactive teaching materials on Arabic rules.

Research Gap Analysis and Conceptual Framework

1. Research gap analysis

Based on the comparison of previous research, there are three relevant study areas. First, in terms of the research object, a number of studies discuss the use of concept maps as a learning method or visual media, while studies on the integration of concept maps, rule materials, interactive exercises, and feedback in one teaching material still require further exploration. Second, in the methodological aspect, research that is oriented towards improving learning scores provides information about changes in achievement, but does not necessarily explain how students understand concept structure, use interactive features, or overcome difficulties during the learning process. Third, in the context aspect, the findings of second language learning in general cannot be directly transferred to nahwu and sharaf learning without considering the characteristics of the Arabic grammatical system.

The gap is formulated based on a comparison of the sources studied, not the claim that research on interactive teaching materials based on concept maps has never been conducted. Therefore, the contribution of research needs to be placed on deepening the context and the relationship between the substance of the rules, visual organisation, interactive activities, and user experience. This approach allows researchers to produce a

more detailed understanding of how teaching materials are designed and used, rather than just determining whether concept maps result in improved learning scores.

2. Conceptual framework of the research

The conceptual framework of this research is built from the relationship between four main components, namely the characteristics of the Arabic language rules material, concept map design, the interactivity of teaching materials, and the user experience. The characteristics of the material are the basis for determining the concepts that must be presented and the relationships that need to be shown. The concept map design then organises the material based on the hierarchy and the relationship between the rules. Interactivity connects the representation with student activities through navigation, exercises, application of rules, and feedback. All components are then examined through user experience to understand the aspects that help or hinder the learning process.

The framework is not intended as a causal model that states that one component inevitably produces the next. In qualitative research, this framework serves as a guide for observations, interviews, and analysis of documents. Researchers remain open to findings that emerge in the field, including previously unforeseen relationships. Analysis can be directed at the accuracy of concept representation, the alignment of activities with learning objectives, the way students interpret the relationships between rules, and conditions that affect the use of teaching materials.

Conclusion

Based on theoretical studies and previous research, interactive teaching materials on Arabic rules based on concept maps can be understood as a learning tool that integrates the accuracy of nahwu and sharaf materials, visual organisation of knowledge, interactive activities, and evaluation and feedback. The foundations of meaningful learning and constructivism provide perspectives to explain how students connect new knowledge with previous understandings, build relationships between rules, and apply concepts in linguistic analysis. Previous research shows the potential of concept maps in supporting language learning, but also shows the diversity of contexts, designs, and research orientations.

Thus, the contribution space of this research lies in deepening the characteristics of interactive teaching materials, the process of organising Arabic language rules materials, and the user experience in utilising concept maps to understand the relationships between rules. The qualitative approach allows these three aspects to be studied contextually through document analysis, observations, and interviews. The results of the study are expected to make a theoretical contribution to the development of knowledge representation-based teaching materials, as well as practical contributions for lecturers and developers of teaching materials in designing Arabic language learning that is more structured, interactive, and in accordance with the needs of students.

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