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THE NATURAL ORDER HYPOTHESIS AND COGNITIVE LOAD IN LANGUAGE EDUCATION

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Abstract : This article analyzes the role of the cognitive approach in native language education, particularly the correlation between the "natural order hypothesis" and "cognitive load theory," from linguodidactic and psycholinguistic perspectives. The article puts forward practical and methodological recommendations for enhancing academic literacy by designing textbooks and curricula in accordance with students' stages of speech development, as well as by optimizing cognitive load.

Keywords: linguodidactics, natural order hypothesis, cognitive load theory, working memory, long-term memory, psycholinguistics, morphemic hierarchy, cognitive optimization, speech competence.

Modern linguodidactics views language not merely as a collection of grammatical rules and linguistic structures but as a complex product of human cognitive activity. In traditional teaching methodology, the logical sequence of subject content—progressing from simple grammatical concepts to more complex ones—does not always correspond to the psycholinguistic stages of children's language development. Consequently, learners' working memory is often overloaded, and the acquired knowledge fails to develop into practical communicative competence.

To improve instructional effectiveness and facilitate the realization of learners' inherent linguistic potential, linguodidactics should pay particular attention to two fundamental concepts:

The Natural Order Hypothesis – the principle that linguistic units are acquired by the brain in a predetermined developmental sequence.

Cognitive Load Theory – the theory emphasizing the efficient use of working memory resources during the learning process.

The analysis of language acquisition should not be confined solely to traditional didactic principles. It is equally important to consider the cognitive mechanisms underlying information

processing and the developmental sequence through which linguistic units are acquired. One of the major challenges of contemporary linguodidactics is to establish a balance between the principles of the Natural Order Hypothesis and the management of cognitive load.

Although Roger Brown (1973) and later Stephen Krashen (1982) primarily developed their theories through research on first- and second-language acquisition, the principle of natural order also constitutes a fundamental methodological principle in mother-tongue education.

According to the Natural Order Hypothesis, grammatical structures and linguistic units are not acquired randomly but follow a predetermined developmental sequence in the human mind. This principle was empirically demonstrated in Roger Brown's longitudinal studies. Regardless of the sequence in which parents or teachers introduce specific grammatical morphemes—such as plural forms or possessive markers—children acquire these linguistic elements only when their internal language acquisition system reaches the appropriate developmental stage. This finding underscores the necessity of aligning the sequence of topics presented in mother-tongue textbooks with learners' stages of linguistic and cognitive development. If instructional materials and curricula attempt to introduce grammatical structures before learners are cognitively prepared to process them, thereby contradicting their internal language acquisition mechanisms, the effectiveness of instruction declines substantially.

Language learning is a complex psychophysiological process that requires a high level of intellectual engagement on the part of the learner.

According to Cognitive Load Theory, developed by John Sweller, human information processing relies on the interaction between working memory and long-term memory.

Working memory has a highly limited capacity and is generally capable of storing and processing only four to seven units of information simultaneously. Within educational settings, cognitive load is commonly classified into three distinct types, each of which manifests in mother-tongue instruction in different ways.

1. Intrinsic Cognitive Load refers to the inherent complexity of the learning content itself. For example, distinguishing between the structures of simple and compound sentences requires learners to process concepts of varying levels of difficulty. Although intrinsic cognitive load cannot be eliminated, it can be effectively managed through appropriate sequencing and scaffolding of instructional content.
2. Extraneous Cognitive Load arises from the manner in which information is presented and from instructional design. Excessively lengthy definitions, abstract explanations, an overabundance of technical terminology, and disconnected grammatical rules unnecessarily occupy learners' working memory, thereby impeding the processing of essential linguistic information.
3. Germane Cognitive Load represents the productive mental effort devoted to integrating new information with existing cognitive schemas stored in long-term memory and transforming theoretical knowledge into practical communicative competence.

The primary objective of mother-tongue instruction is therefore to minimize extraneous cognitive load, appropriately manage intrinsic cognitive load, and maximize germane cognitive load.

As discussed above, human working memory possesses only a limited capacity for processing information simultaneously. Within educational settings, exposing learners to excessively complex grammatical rules, densely formulated theoretical explanations, and unrelated lexical items substantially increases cognitive load. As a consequence, learners tend to focus on memorizing information rather than internalizing it, resulting in knowledge that remains at the level of conscious learning rather than developing into functional communicative competence.

The relationship between the Natural Order Hypothesis and Cognitive Load Theory constitutes

one of the key determinants of effective mother-tongue instruction. When the curriculum is designed in a manner that contradicts the natural developmental sequence of language acquisition, learners inevitably experience excessive cognitive load. For example, requiring students to analyze the structural properties of complex compound sentences before they have fully mastered simple sentence structures creates unnecessary cognitive barriers. In such circumstances, learners may successfully memorize grammatical rules but remain unable to apply them in authentic communicative contexts. This occurs because the brain lacks sufficient cognitive resources to process new theoretical concepts while simultaneously transforming them into practical language skills.

Conclusion

Contemporary linguodidactics in mother-tongue education therefore requires instructional practices that take into account the cognitive mechanisms underlying information processing. Teachers should design learning experiences in which theoretical knowledge is aligned with learners' natural stages of linguistic development. At the same time, cognitive load should be optimized to a level that facilitates, rather than constrains, learners' ability to engage in meaningful and creative communication. Such an instructional approach promotes not only the acquisition of grammatical knowledge but also the development of sustainable communicative competence and effective language use.

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