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DESIGN OF THE MACROSTRUCTURE OF ELECTRONIC TEXTBOOK

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Abstract

The article deals with an aspect of designing a macrostructure of the electronic textbook, that characterizes the structure, organization, ordering, and interdependence of its subsystems and components, and connections between them that are capable of performing relatively independent functions for achieving intermediate sub-targets and at the same time are subordinated to the general textbook purpose. The macrostructure of the electronic textbook "Elementa Linguae Latinae" is described in the paper.

Keywords: *design, macrostructure, electronic textbook, system, functions*

The macrostructure of the electronic textbook is being designed at the technological stage.

T. Kameneva defines the macrostructure of the electronic textbook as a way of organizing information, learning and teaching resources according to the types of activities that students perform in an electronic environment created by integrating different types of information technologies to support the learning process. While the design of the microstructure of the electronic textbook, according to the researcher, involves the creation of a general training script, which is carried out on given quantitative and qualitative parameters of the learning objectives based on the defined patterns of building knowledge, ability, and skills on the subject [1].

In our opinion, the systemic aspect by which the macrostructure is a substructure relative to the general structure of the electronic textbook, and a superstructure relative to microstructure, is reduced in these definitions. According to the principles of system analysis, the distribution of systems into components must be carried out with the preserving a holistic representations of the system and taking into account its relations with other elements of the system and the external environment, while the system itself should be regarded as part (subsystem, element) of a larger system. So, the macrostructure is not limited only to the way of resources organizing but is a much broader concept.

Building a macrostructure involves the allocation of system's subsystems and components that are relatively autonomous and able to perform their own functions. Under the pattern of integrity (emergence), the properties of the system depend on the properties of its parts but are not the sum of the properties of these parts [2, p. 46]. The macrostructure allows submitting an electronic textbook as a set of its largest parts and the links between them, ensuring its integrity and identity.

The macrostructure characterizes the structure, organization, ordering, and interdependence of electronic textbook's subsystems and components, and connections between them that are capable of performing relatively independent functions for achieving intermediate sub-targets and at the same time are subordinated to the general purpose of the electronic textbook [3, p. 137].

In the system analysis, on the principle of modular construction, a system should be regarded as a set of interconnected modules, which are considered models of its components and subsystems [2].

The principle of modularity, as noted by O. Goncharova, takes centre stage in the design of modern computer training programs. Such software tools are more suitable for modernization and improvement, they are easier to configure (by separate modules), often modules are autonomous and can be used as stand-alone programs [4].

Most of the researchers support the modular structure of electronic learning tools. The principles of modularity or discreteness of structures (M. Izergin, T. Kamenev, A. Kudryashov, V. Osadchy, A. Rudnev, V. Tegin, S. Sharov), or quantization (O. Zimin, A. Kirillov, O. Mukoviz) provide for the division of the electronic textbook structure into the training modules, which are minimal in amount, but complete in content.

The design of the macrostructure of the electronic textbook involves setting the main structural and functional components [1]. The module, which is considered as a relatively autonomous, functionally completed section of the electronic textbook containing the block of didactically processed, adapted and structured information, is selected as the main structural and functional unit of the author's electronic textbook in Latin "Elementa Linguae Latinae".

According to O. Topuzov, one of the fundamentals of designing a textbook based on a competent approach is the structuring of content by the principle of separation of empirical and theoretical blocks:

a) empirical knowledge (concepts and terms);

b) theoretical knowledge (laws, theory, hypotheses, interconnection objects, processes, phenomena, their structural characteristics, peculiarities, and patterns of development) [5].

Specifying, selecting and structuring the content of training material is extremely important in the design procedure.

As noted Bykov, V. Kukharenko et al., different approaches (logic structure chronology, concentric circles, spiral sequence, the sequence of causes, etc.) may be taken in streamlining the content, after determining which the first version of organizing training materials may be created, where should pay attention to examples, concepts of relations, rules and procedures for ensuring the correctness, completeness, functionality, volume, consistency and coherence of content [6, p. 142].

In designing an electronic textbook in the Latin language, streamlining the content was carried out by the logic of the structure. Thus, two basic modules "Guide" and "Dictionary", which can be used as stand-alone units, as well as in the complex and the service module "Help" were designed in the macrostructure of the electronic textbook "Elementa Linguae Latinae" [7, p. 27].

The module "Guide" contains a short course in Latin, in which basic phonetics and grammar knowledge required for mastering the skills of reading, writing, translation, and analysis of veterinary terms is provided in a concise and accessible form. This manual differs from the printed editions by structuring the learning material.

The structural unit of the module is a section, which, in turn, is divided into topics and subtopics. The module contains the sections "Phonetics", "Morphology" and some special topics provided by the syllabus of academic discipline "Latin language", as well as a preface and a list of recommended reading and resources.

The "Phonetics" section covers subtopics: "Latin alphabet", "Vowel and diphthong pronunciation", "Consonant pronunciation", "Long and short syllables", "Accent".

The section "Morphology" contains the topics: "Noun", "Adjective", "Verb", "Numeral", "Pronoun", "Adverb" etc.

Special topics include "Structure of anatomical terms", "Recipe", "Dosage forms", "Latin chemical nomenclature" etc.

The module provides the implementation of information, systematization and self-control functions. The information function is provided by fixing the substantive content of training at the level of grammatical material, is realized through the availability of information on Latin phonetics and grammar, as well as some professional topics.

The systematization function is implemented at the level of the language – the training material is structured according to the subsystems of the language: phonetic and morphological. The material is structured and presented in the format reference manual with cognitive-graphic models.

The thorough structuring of the material ensures the realization of self-control function since the manual can be used as a guide in student autonomous work, training for control tests.

The Dictionary module consists of three sections: "Dictionary" itself (4,000 units), "Terminological elements" (300 units), and "Phrases" (300 units) [7].

The module “Dictionary” relies on the implementation of the general functions of information, systematization, self-control, as well as specific: training and normative.

Information function is provided by fixing the substantive content of training at the level of terminology material, is realized through the availability of Latin/Ukrainian term’s equivalent, information about the origin of terminological elements, semantization, and partial term interpretation. The dictionary in this aspect is considered as a source of information, a means of access to accumulated empirical knowledge in the subject field.

The systematization function is implemented on two levels: language level and of the terminology system level. Firstly, because of the special dictionary macrostructure, which consists of three sections, the material is represented by the subsystems of the language: lexical, morphemic and syntactic. Secondly, the term itself by its very nature is systematic and the semantization of the term in the dictionary implies a description of a certain fragment of the terminology system.

The self-control function, which involves the purposeful forming students' abilities and skills in translation, assisting them in mastering the material and relying on it in practice, is realized through the availability of detailed grammar, lexical and syntactic comments, as shown in Figure 1.

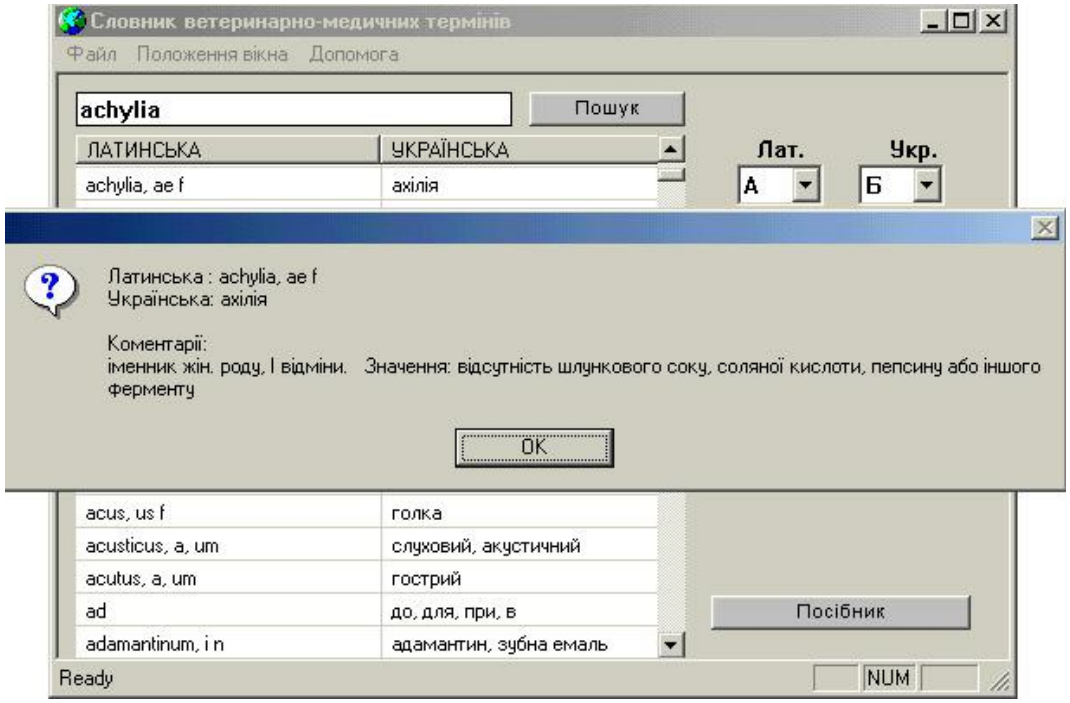

Figure 1. A dialog box with grammar and lexical comments on the Dictionary module

In the module, the training function is implemented primarily at the level of targeted orientation of the vocabulary, the principles of selection and description of a lexical material, provided by its compliance with the curriculum and complementarity with other learning tools, the availability of special instructional comments.

In addition, the module carries out a specific to dictionaries normative function, aimed at fixing the rules of use of terms, implemented by the representation of terminological polysemy and synonymy, information on terminological compatibility, syntactic constructions on the basis of which typical multicomponent terms are built, the fixation of the rules of the use of terms, orientation to latest editions of the veterinary nomenclature.

The module «Help» contains general information about the manual and program, a description of the structure of the dictionary and entry, the user's guide, a list of conditional abbreviations, references. The main functions of the module are the reference and organizational one.

The macrostructure of the electronic textbook is shown in Figure 2.

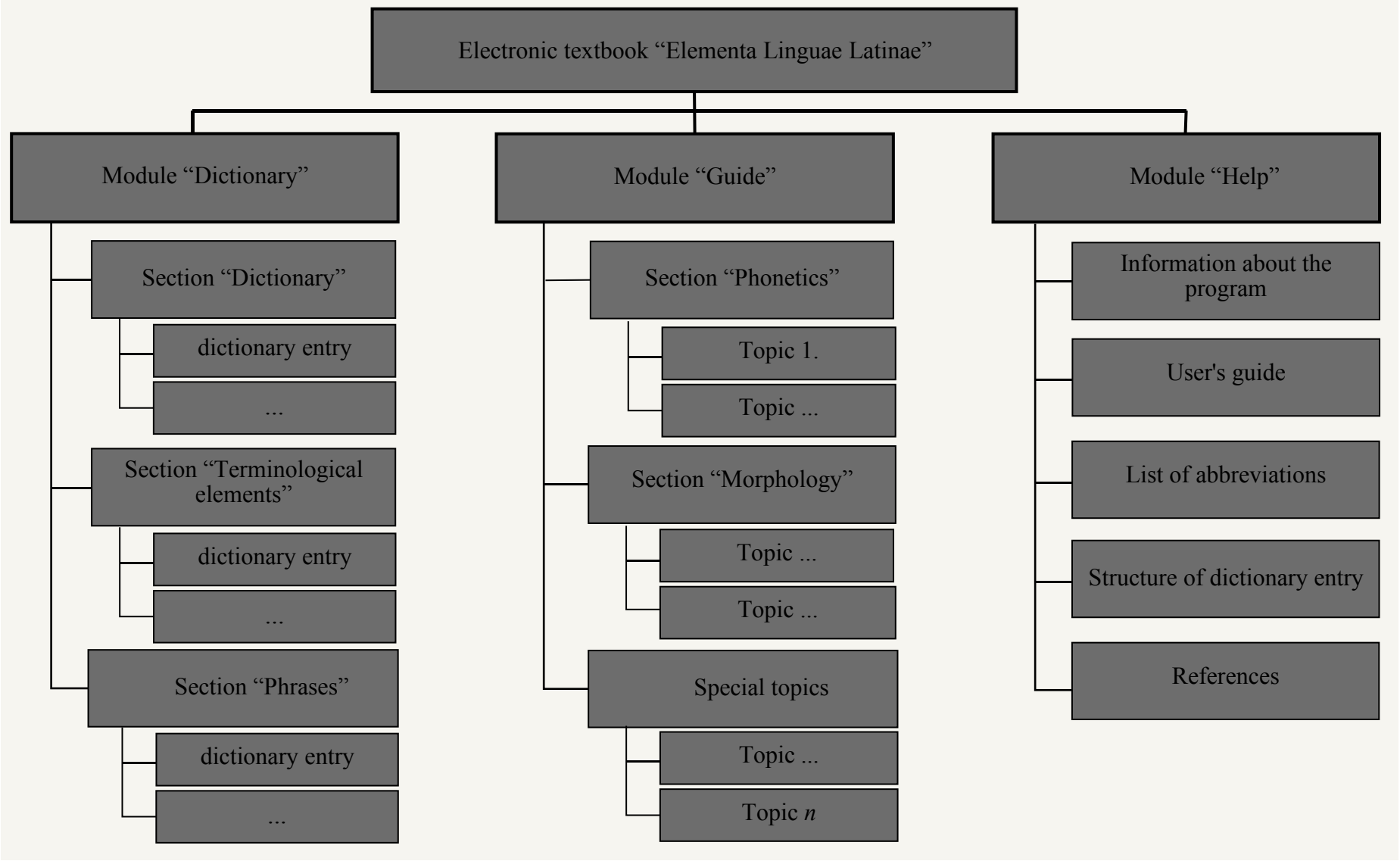

Figure 2. Macrostructure of electronic textbook “Elementa Linguae Latinae”

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