The development of the application for support the intellectual analysis of texts of the humanities and socio-economic cycle

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Abstract. The article is devoted to the consideration of the problems of didactic design of teaching materials by a teacher of disciplines of the humanities and socio-economic cycle associated with the study of a significant amount of information from various sources, the need to select a number of literary sources taking into account their specifics for different educational tasks and types of educational activities, as well as ranking the most important didactic units for the formation of working programs of disciplines. The possibilities of using automation tools for the analysis of text materials are revealed, which will allow a teacher engaged in the didactic design of a particular discipline to conduct a syntactic analysis of methodological materials, significantly reduce the complexity of this process when developing, making changes and adapting courses of social and humanitarian orientation. As a result of the analysis of the subject area, the authors determined a list of functional requirements, based on which the results of the physical and logical design of the system were presented, including a database model, system architecture, as well as a deployment diagram using an object-oriented modeling language.

1 Introduction

The didactic design of teaching materials, performed by the teacher before initiating of discipline implementation, is inextricably linked with the process of forming the student’s competencies.

A special place here is occupied by the disciplines of the humanities and socio-economic cycle, associated with the studying of a large amount of information from various sources (books, educational websites, monographs, scientific articles).

The process of didactic design is also complicates by the necessity of monitoring of trends in the ontology of the subject area of the discipline, in connection with new assessments, opinions in the modern scientific environment, the implementation of the

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principle of interdisciplinarity and the escalation of the applied nature of study of social sciences - in the context of competencies laid down in the educational standards [1].

Due to the fact that the labour input (complexity) of the discipline is limited, the teacher is faced with the problem of ranking the most important didactic units of the discipline's work program and the secondary ones, on the basis of which the reference lecture notes and other methodological materials are often compiled directly by the expert teacher.

Taking into account the necessity to pay attention to all sections of the discipline, during the training period, as well as to reveal the diversity of aspects of each topic in a meaningful way, the question of the most effective allocation of time resources for the didactics of the discipline under study becomes relevant [2].

Modern education is aimed at studying both fundamental disciplines, whose content is sufficiently standardized, and new disciplines, whose didactic design must be carried out from scratch.

A number of such courses may belong to different categories of academic disciplines of the humanities and socio-economic cycle.

When developing a discipline, a teacher faces the problem of selecting educational and methodological material, assessing its completeness, assessing the compliance of materials with the competencies being formed, as well as types of educational activities, teaching methods (lectures, practical classes, independent work of a student; discussions, research work, case studies, etc.)

Such activity is associated with great labor intensity, especially in view of social and humanitarian disciplines, since it requires selecting material from the relevant sources, taking into account various aspects of the covered topics [3].

For example, in history, when studying various historical epochs, there is a requirement to disclose the political, social, spiritual, economic sphere of society; in philosophy - ontological, epistemological, anthropological, social issues of a particular epoch or personality.

Taking into account the need to make changes and create adaptations of discipline programs, the task of processing the existing one is regularly arises.

The selection of educational and methodological literature that covers all the described requirements.

It is obvious that when developing from scratch, making changes, as well as adapting these programs, and especially when developing programs in new disciplines, the teacher is forced to independently analyze the formulations of competencies and expertly select educational sources and analyze a large number of text materials [4].

Thus, there is an urgency of automatic analysis of text materials, which will significantly reduce the complexity of this process when developing, making changes and adapting courses of social and humanitarian orientation.

There are various means of electronic learning materials, however, they are aimed only at demonstrating of ready-made educational material (E-books, tables or dictionaries).

These are resources where materials on the topic under study are accumulated, but they lack decision support functions during designing of an academic discipline [5].

Since the formulations of competencies, learning outcomes, sample topics in the work program and in the teaching materials of the teacher have a verbal description and a basic terminological apparatus, the search for these entities can be carried out by an information system.

Thus, the usage of automation tools makes it possible to carry out syntactic analysis of methodological materials according to predefined relevant sources, to select the materials by keywords, covering educational competencies even within the framework of the work program of the discipline as a whole, or within the framework of a particular type of educational activity, (for example, to assist in the organization of independent work of the
student - to select materials for seminars, as well as in preparation for certification events, taking into account the key sections that should occur in them) [6].

2 Materials and methods

The application should provide a teacher engaged in didactic design of a specific discipline or a number of disciplines with the recommendation tool, that reduces the complexity of developing teaching materials by the teacher himself.

The system should be able to set a limit on the volume of selected material on each topic, take into account the frequency of occurrence of certain terms, personalities in teaching materials, in order to prevent uneven consideration of several topics to the detriment of others.

The system must maintain the limits on the volume of material at approximately same level, and also allows to the user to select information in the given percentage for each topic.

For example, in history, considering the epochs of the rule of various political figures, somewhere it is necessary to pay more attention to the military sphere, and somewhere social [7].

The teacher himself, knowing the significance of the particular topic, sets these percentages – the system will take this into account automatically.

During the analysis of the subject area, a list of functions that need to be implemented in the designed software product was identified:

• creating a display profile;
• creating a type of literature, specifying the title, and the format of the processed text;
• viewing the list of projects;
• creating a list of topics under consideration;
• indication of the preferred share and list of keywords of each topic within the discipline program;
• creating a list of areas under consideration in each topic (optional);
• specifying the share and list of keywords of each sphere within a separate topic;
• adding parameters of a programmable search engine Google for main and additional sources for a specific project;
• selection of the literature files to be analyzed;
• selection of the type of literature and determining whether the literature is the main one;
• obtaining data from the selected main and additional Internet sources;
• analysis of the frequency of keywords in the processed literature;
• conclusion of the state of analysis, the result of analysis, the final specific ratio of topics and spheres as a result.

Based on the definition of functional requirements, the system was designed at the logical and physical level.
3 Results

The results of database design and system architecture are presented in Figure 1:

Fig. 1. Application architecture model.

The following tools were used for the software implementation of the system:

- Java – a high-level programming language that provides to the programmer a rich set of object classes for clear abstraction of many system functions, used during the work with windows, the network and for I/O.

- IntelliJ IDEA Ultimate is the leading Java rapid develop environment. The environment is a high-tech complex of closely integrated tools, an intelligent source editor with advanced automation tools, powerful code refactoring tools, built-in support for J2EE technologies, integration mechanisms with the testing environment Ant/JUnit and version control systems, the unique optimization and verification tool;

- Spring Framework provides a comprehensive development and configuration model for modern Java business applications - on any platforms.

- A key element of Spring is application-level infrastructure support;

- MySQL is an open source relational database management system, almost all web frameworks support MySQL is already at the basic configuration level.

Among the advantages of this DBMS is worth noting the simplicity and flexibility of use [8];

- MySQL Workbench is a visual database design tool that integrates database design, modeling, creation and operation into a single seamless environment for a database system MySQL.
4 Conclusions

Thus, this tool will make it possible to support the didactic design of disciplines in the social and humanitarian profile, reducing the labor intensity of the teacher’s work, and recommend materials to the teacher, claiming the relevance of the selected information. As well as this tool will allow to give recommendations on the frequency of occurrence and on the specific ratio of topics within the program or didactic units within each topic.

References