

Knowledge-Based E-environment for Bulgarian Cultural Heritage with Focus on Learning

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Abstract. The article discusses the “Bulgarian cultural and historical heritage under the protection of UNESCO” database, developed in IMI (BAS). The database will be used to integrate new learning content to an e-course – a project still in its development stage. The database has been developed with the aim to give students the opportunity for broader knowledge and understanding of the national cultural heritage. Understanding of history helps develop a sense for the general advancing of society. The project is regarded as a modern teaching strategy, based on the learning approach *Understanding by Design*, with an emphasis on the interaction between the learner and the learning content.

Keywords: Cultural Heritage, Database, Digital Object, e-Learning Content, UNESCO.

1 Introduction

The mission of The United Nations Educational, Scientific and Cultural Organization – UNESCO – is to provide general access to information and information technologies- its purpose is to encourage and facilitate knowledge and cooperation, sharing of values, fostering of understanding, interpretation and preservation of cultural environment. UNESCO emphasizes on the necessity of improvement of the quality of education through the introduction of better practices for the educators and the mobilizing of more resources.

School education is a national priority and as a process includes: training, education and socialization of the learners. Its main goals are:

- Intellectual, emotional, social, spiritually moral and physical development and support for each learner;
- Knowledge of the European and world’s cultural values and traditions and the preservation and affirmation of the Bulgarian identity.
- Acquiring competencies necessary for successful accomplishment of active citizenship, understanding of the global processes and trends and their interrelations;
- Forming of sustainable mind-set and motivation for lifelong learning.

The educational paradigms are changing to results of the education and the use of practical experience in the curriculum. This requires educational methodologies and approaches that encourage learning and support learning skills. It’s beneficial to develop

learning environments inspiring learning. Technologies allow the learners to participate in the development and the selection of their own learning environment.

2 Education Focusing on Learning

The interactions between curriculum, technologies and pedagogical solutions are the basis for the development of context-specific approaches with productive integration of ICT i.e.:

- Use of the digital reality to present structural and integrated curriculum and applying scientific principles for its comprehension;
- New forms of presenting the information and activities, provoking thinking, developing communication and technological skills.

The education is based on creating links between previous knowledge and experience with expert opinion. Isolated taught fact does not create link. Information without context is not knowledge.

Learning is a *process* of connecting information collections. The connections between ideas or areas lead to the creation of new information collections and additional links and form ability for distinguishing essential from insignificant information.

Learning *leads to* alteration of cognition and changes in behavior based on receiving, processing (structuralizing and rationalization) and transmitting information.

Learning *depends on* the learning experience, information, motivation and conditions for learning. Learning in a digital environment by influencing a large number of senses ensures additional emotional cognitive activity and motivation:

- Allows effortless assimilation of curriculum and effectiveness in studying (combination of information and change in course of actions while executing tasks);
- Predisposes students to gain personal experience through discovering new or additional meaning, to analyze data and revise their own understandings and common knowledge.

3 History as a Key Field of Study

Studying History is key area in education. History is the science of change- it studies different societies, discovers and interprets their reactions to conditions and events which induce change. It ensures continuity. Through exploring nations and cultures we understand processes of change and succession which have formed the world today. All cultures are complex and have a significant impact on modern societies. History accepts the importance of the most ancient cultures on Earth as well.

The exploration of the past, despite the fragmentary nature of existing evidence, provides unique challenges for the learner. Today, the historical education relates not to the quantity of historical facts, but to its processing and conversion into abilities and skills: historical literacy, historical language, historical concepts, and historical memory.

Evaluating and researching historical sources is essential. Students understand that these sources can be valuable, subjective, ambiguous or incomplete. They improve their skills to deliver opinions on various issues. Interaction with sources varies with time. In searching for explanations of historical events and processes, learners meet and understand key concepts: change, continuity, cause, movements, impacts, results. These are valuable concepts of understanding the present.

The curriculum (in most modern teaching aids) contains many or insufficient facts for individual conclusions to be drawn; conceptual understanding is not achieved and key competencies (knowledge, skills and attitudes) that lead to the generation and accomplishment of ideas are not reached.

4 The UBD Approach

Learning to understand suggests that by questioning knowledge much more can be understood and learned. Answers of the student to questions such as – “Why is this so?”; “What are the proofs?” - develop different forms of knowledge transfer. Understanding is a successful result or an attempt to find a connection with or within a previous idea - how separate knowledge without a clear structure can be seen as part of a larger, more meaningful and more useful system.

The approach *Understanding by Design* (UBD for short) (Wiggins & McTighe, 2012) focused on results rather than content as set of ideas and practices (for planning, learning, evaluation) is a tool for:

- designing a learning process;
- developing curricula;
- expanding traditional teaching methods;
- developing training courses.

Understanding by Design is a **philosophy of teaching and learning**. This is an interdisciplinary approach (related activities in a broad context), implying links and meanings. Understanding a concept is developing interconnected abilities. The *Understanding by Design* approach is:

- A way of thinking with priorities - great ideas and research of basic issues with authentic application;
- A way of designing or revising a learning pathway to achieve, develop and deepen understanding.

5 Software Environment for Additional Learning Content

E-learning (technology-driven and learner-centered) is based on the learning process in a specific experience and multi-directional research with results: more rational thinking, deeper understanding, higher academic achievement, more skillful, quicker and

more adequate transfer of knowledge. The Internet offers an information learning environment for learning that changes the quality of information. Educational electronic resources enhance access to learning and are tools designed in a pedagogical framework to develop versatile competencies and cultural change through visible “learning experience”. The digital environment offers dynamic development, innovative thinking and a new set of skills (parallel processing, graphical awareness and random access) which reflect the learning and way of thinking, adaptation, interpreting and using information. In the pedagogical process there is a continuous exchange of information and experience - a basis for pedagogical interaction of a new type.

The main mission of the teachers is to train intellectual skills enabling information expertise. Successful teaching leads to effective learning. Learning is a successful attempt of the student to understand. Achievement is the result of the student’s success in gaining meaning after the teaching, culminating in a competent performance.

The project Interactive Software Environment “UNESCO Bulgarian Architectural Heritage Sites” (BAO-UNESCO), which we present briefly here, was developed at IMI-BAS (Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences). The BAO-UNESCO Software Environment uses the “Architectural Heritage Sites in Bulgaria under UNESCO Protection” (shortly DB BAO-UNESCO) database. The E-learning environment BAO-UNESCO is based on the State Educational Standards for learning content of the “Social Sciences and Civil Education” subject cycle (SES, 2016).

The DB BAO-UNESCO database is designed and created as an integrated system of specialized knowledge of the seven sites of world cultural and historical heritage in Bulgaria under the patronage of UNESCO. These are seven architectural and historical landmarks in our lands - cultural monuments that meet the criteria set in (UNESCO, 2017 last edition).

According to the UNESCO List, the first four cultural monuments were included in 1979: Boyana Church, Madara Rider, Thracian Tomb of Kazanlak, and Rock-Hewn Churches of Ivanovo. The next two sites - Rila Monastery and Ancient City of Nessebar - were registered in 1983. In 1985, the Thracian Tomb of Sveshtari was included. The selection and monitoring of UNESCO sites is focused on certain characteristics, e.g. bearer of values, form, material, location, etc. These characteristics are decisive in collecting and arranging information about them in DB BAO-UNESCO database. The very presentation of the objects ensures their significance in the context of the learner.

The database ensures opportunities for maximum functionality and full utilization of information (organization of contextual information and hyperlinks) in order to foster personalized knowledge (Kovacheva, 2015), (Kovacheva, 2016). The idea is to present the new or supplementary learning content as a set of hyper-documents, combined with multimedia components, delivered as learning materials via Internet (see Fig. 1 – Fig. 4).

The database is presented with a tree structure. DB BAO-UNESCO contains 7 types of objects: **city** (Ancient City of Nessebar); **monastery** (Rila Monastery, Rock-Hewn Churches of Ivanovo); **church** (Boyana Church); **tomb** (Thracian Tomb of Kazanlak, Thracian Tomb of Sveshtari); **relief** (Madara Rider); **Dictionary** and **UNESCO**. All objects in the Database are complex objects.

For the description of architectural historical objects, we use metadata - a set of attributes located on several levels, with certain values. Attribute values are texts and images that are the main learning content. The attributes are divided into three groups. The first group consists of the attributes corresponding exactly to the characteristics of UNESCO criteria. The second group contains attributes which value carries new (additional) knowledge not provided for in the UNESCO criteria, but will definitely attract the interest of the learners (history of the monument, the object in literature, artifacts found on the site and others). The third group includes attributes that are specific to a particular type of objects, e.g. frescoes - for churches and monasteries; adjacent to the monument environment - the Madara Rider and the Rock-Hewn Churches of Ivanovo.

The Dictionary and UNESCO objects are designed and developed specifically to provide learners with additional knowledge that they cannot find in their teaching aids.

The electronic dictionary is an easily accessible book of reference that offers a large amount of information about words describing the subject (shape, meaning, usage and origin). The main reason for including a dictionary in the BAO-UNESCO as an object is that it provides specific knowledge, which is added to the general knowledge and enriches a child's outlook on the world. The dictionary demonstrates the transition from meaning towards the symbolic nature of language and develops the linguistic culture of the learners, because it contains a specially selected conceptual apparatus. The dictionary entries contain information about concepts that (1) are not present in textbook materials and (2) complement grammar, semantics, etymology and usage. This facilitates the text comprehension and enriches the vocabulary by unveiling the relationship between words and concepts (their meanings).

The object UNESCO of the Database provides knowledge about the United Nations and its specialized agency UNESCO (United Nations Educational, Scientific and Cultural Organization). Some useful information is included in the description, because UNESCO works with all countries worldwide to discover cultural and natural sites that can be defined as world heritage, unique and diverse natural sites, and historical and cultural sites. The main mission of UNESCO is to contribute to the building of peace and security in the world, by promoting collaboration among nations through education, science, culture and communication in order to further universal respect for justice, for the rule of law, and for the human rights and freedoms.

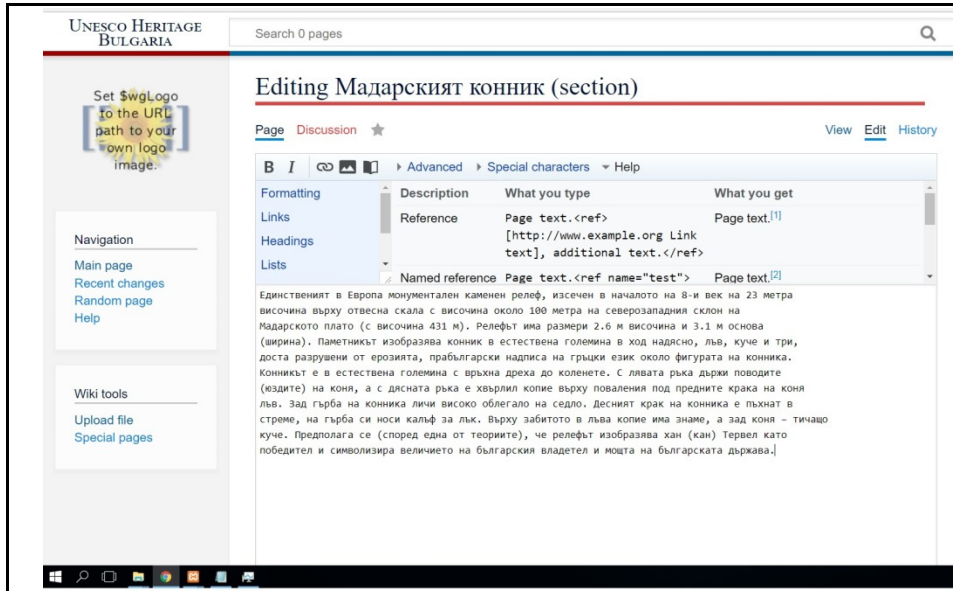


Fig. 1. Presentation of a content: *Description of the object “Madara Rider”/section Editing/*

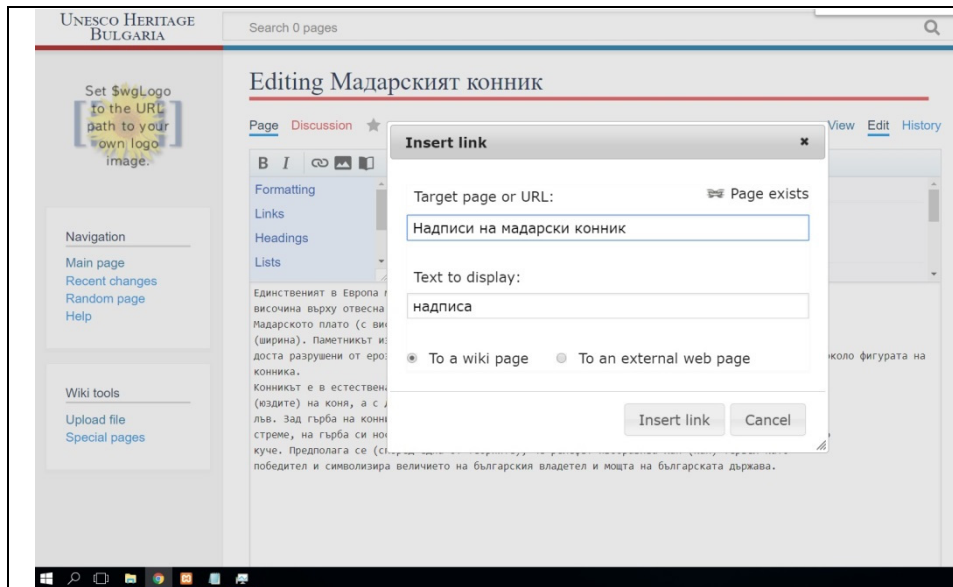


Fig. 2. Connection “Level-2 (*Description of object “Madara Rider”*) to Level-3 (*Inscriptions*)” /section Editing, insert link/

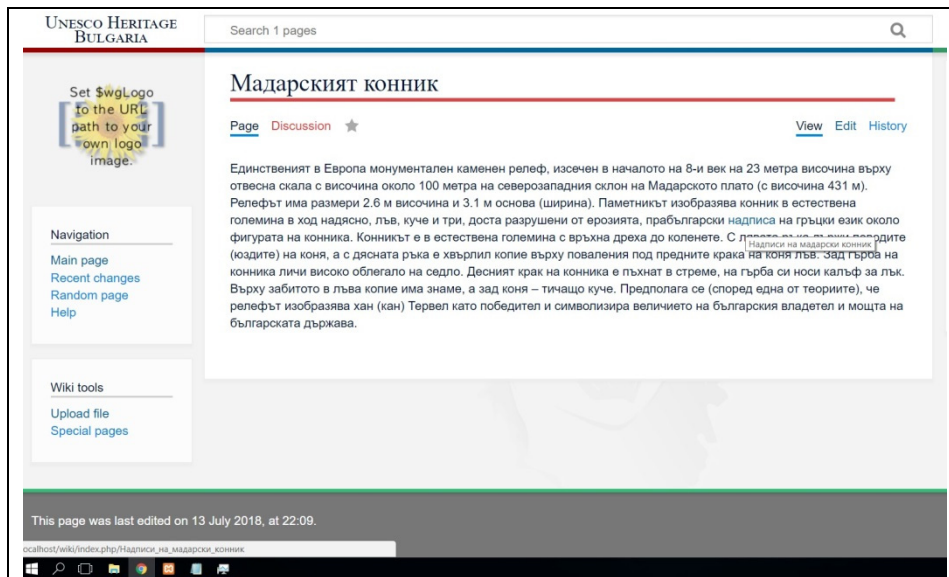


Fig. 3. Screenshot, presenting “search” in the *Description* of the object “Madara Rider”

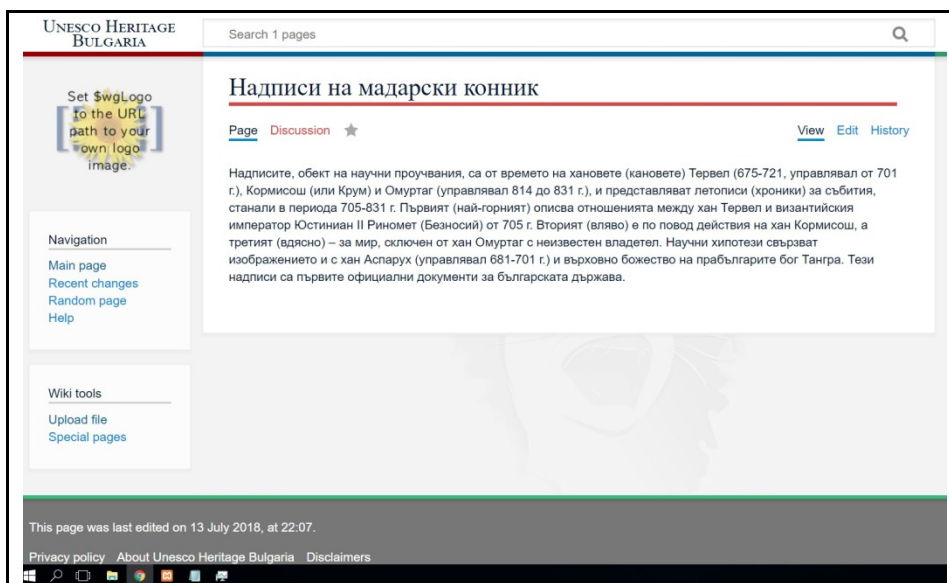


Fig. 4. Presentation of the inscriptions on the object “Madara Rider”

6 Evaluation Module “*I create*”

Specialized evaluation module as a part of this E-learning environment was designed

and developed. Such a module ensures realization of some important educational activities. Our system's evaluation module "I create" has three main functions, defining the key parameters of the environment:

- Opportunity to generate learning content with active user participation,
- Online collaboration,
- Free information exchange.

This module allows learners to become active participants in the preparation and presentation of new or supplementary information about architectural or historic sites from their home area into the database BAO-UNESCO. This database can be used in the creation of a website, dedicated to the learners: the students will be able to present regional cultural monuments and exchange information, concerning the perception and understanding of Bulgaria's cultural values (Kovacheva, Dimitrova, & Pezhgorski, 2016). Playing with the evaluation module provides knowledge practitioners with the opportunity to operate with logically presented information and concepts in different areas of knowledge.

7 Concluding Remarks

The software environment will allow learners to have concepts and impressions from the presentation of objects in the database that educate and enrich at the same time. This adds additional **cultural memory**. Main results that we expect are:

- **Information literacy.** Efficient (in time) and effective (in sources) access to information and its competent assessment. Ability to appropriately access information and use it to manage information flow from different sources.
- **Comprehensive and functional literacy.** Functional literacy is "taught" as a set of functional skills and practices for its use in a way that promotes social awareness and critical reflection as a basis for personal and social change.
- **Key Competencies.** In order to derive the benefits of technological development, comprehensive curricula should be created for the advancement of "key competences" - linguistic, mathematical, digital, social and civic, cultural, learning and sustainable development.
- **Transversal Competences (21st Century Skills).** Important, useful, necessary and universally applicable skills. They reflect the specific requirements needed for guidance in a complex, competitive, knowledge-based, information age, techno-oriented economy and society.
- **Multiple intelligences.** Intelligences are cognitive abilities and show the ways (patterns) a learner thinks. The MI theory is useful for teachers in developing their educational strategies to make sense of the cognitive skills of learners in a context.
- **New learning culture.** Using reliable information and developing analytical and combinational thinking outside the stereotype, as well as originality and flexibility in non-standard situations.

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