

# University Platforms for Digital Academic Knowledge in Bulgaria— Isolated “Pockets of Excellence”

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## Abstract

The paper describes the new developments in Bulgarian universities concerning the creation of homogeneous infrastructure for electronic access to academic information. Presented are some local and national initiatives for integration of e-learning and e-research, for development and implementation of software digital platforms. Difficulties and practical problems and particular for the Bulgarian situation are discussed.

## 1 Development of Contemporary Online Archiving Systems

A number of Bulgarian universities have already recognized the need for online archives of academic knowledge, for integrated e-research and e-learning platforms, and have taken steps for their implementation. The methodologies and tools for online teaching and learning are not very widely implemented at the Bulgarian universities yet, but there are some visible efforts in the developing of contemporary online archiving systems, i.e.:

### 1.1 Sofia University: ARCADE system (<http://arcade.fmi.uni-sofia.bg:8080/arcade/>)

ARCADE (Architecture for Reusable Courseware Authoring and Delivery) is an integrated software platform for authoring and delivery of Internet-based distance learning courses. It was developed by a team of researchers and students at the Department of Information Technologies, Faculty of Mathematics and Informatics. The system includes the following modules: User Management, Course Delivery, Curriculum Management, Student Assessment, and Communication. ARCADE serves five categories of users: Student, Course Author, Instructor, Course Administrator, and System Administrator.

Different system functionalities are defined for each role, and any user can play more than one role.

All functions implemented in ARCADE are accessible by a web browser. Users are not required to install browser plug-ins. This makes the system platform independent and provides flexibility to students, instructors and administrators.

The system's modular architecture makes it applicable for universities or other educational institutions. The ability to acquire knowledge at any time and any place makes it suitable for the purposes of the life-long learning, especially in such dynamic areas as ICTs. The system is currently in its pilot-testing phase.

### 1.2 Medical University–Sofia: Flexible Problem-Solving Oriented Web Based e-Learning System

The Medical University-Sofia, supported by the Open Society Foundation, has taken the first steps in introducing a flexible problem-solving oriented web based e-learning platform in Biochemistry to serve as a model to the other university departments.

The collaboration among specialists in Biochemistry and Informatics has led to the successful design and development of two course support systems (CSS) through which two fully operational websites have been created for a Web-based course on “Interactive Biochemistry”:

- <http://biochemistry.dir.bg> (Java Script-HTML CSS)—developed in 2000 in collaboration with specialists from the Department of Information Technologies at Sofia University;
- <http://biochemistry.orbitel.bg> (PHP-based)—developed in 2002 in collaboration with a commercial partner, Netage Solutions Inc.

Both systems support the following modules for students: “Lectures” (a source of knowledge), interactive “Tests” for (self)-assessment, and interactive “Clinical Case Simulations”, to improve and assess professional skills. These modules generate thousands of pages dynamically. The lectures are richly illustrated, including animations and virtual models. The tests permit different ways of question distribution: consecutively or randomly.

The administrative module provides a useful tool for creating and editing on-line courses by teachers with limited web-design skills. The dynamic database contains information about the users and their rights, teaching units, and sub-units. The system allows insertion of multimedia files, creation of links within and between different course sections or external sources, reports on students’ progress, and quality of test questions.

The original course on “interactive Biochemistry” is a good example of the integration of the latest achievements in biochemistry (modern content), information and communication technologies (Web environment), pedagogy (flexible learning), and medicine (problem-based learning). These new methods are well accepted by both regular and correspondence students, as well as by lecturers who appreciate the usefulness of the course and the usability of the system.

### 1.3 University of Plovdiv

The University of Plovdiv is also developing its own e-learning system, **PeU** (<http://peu.pu.acd.bg>). It is a platform for developing and maintaining a Web-based environment for modeling the process of teaching and learning. There are two types of elements in this system: **subjects** (students, teachers, authors, guests, administrators) and **objects** (syllabi, courses, instructional materials, test, etc.) and five **subsystems** (for training, course authoring, testing, communication, and administration).

### 1.4 Technical University—Rousse. The Virtual Center „e-Learning Shell”

The Virtual Center „e-Learning Shell” is a platform for developing Web-based courses (<http://ecet.ecs.ru.acad.bg/else/index.php>). It has been developed by a doctoral student and is in use here since March 2002. The platform is used by students as a virtual library as well. So far, 70 courses have been integrated into it, and this number is planned to grow to 150 by the end of 2005. About 500 students are enrolled in courses using this system, and 14 Bulgarian universities and institutes have bought the platform so far, as well as three in Russia, Hungary and Germany.

## 2 Problems Connected with the Digitalisation of Academic Knowledge in Bulgaria

Among the most innovative orientated academic circles there is a clear understanding of the evident need for (finding an adequate way to meet the demand of) the digitising of the existing academic knowledge as soon as possible and as much as possible. In the processes of digitising of the knowledge, which is available in the universities (based on online platforms), the knowledge management practices, both human and technology orientated, should be widely applied. The implementation of e-based research, teaching and learning requires thinking further beyond the concept of finding simply the technological solution. The knowledge management initiatives are required to support the organizational changes (during the establishment of the online platforms) at two levels: at the level of the organization—its vision, management, culture and practices, and at an individual level—the attitudes, values, beliefs and habits of the administrative and teaching staff.

In most cases, the level of electronic publishing, of e-learning, e-teaching and e-archiving of the academic texts in universities is only sufficient to cover the minimum requirements set by the National Agency for Assessment and Accreditation, but compared to the growing needs of the academic community, it is largely insufficient in terms of required quality and reach (in the aspect of practical accessibility for both—staff and students).

Most often, the reason for the underdevelopment is shortage of funds, but sometimes it is also due to the rigid management. This management is often not willing to undertake the necessary organizational changes or there is not a very good understanding of the importance of using modern technologies and e-resources for learning, teaching and research purposes. Very often the management is trying to resist to those changes in order to avoid another crucial consequence of the digitisation processes—the need to train all the users of such kind of platforms and systems.

One of the biggest national initiatives in the sphere aims to find solutions of these and other problems like the need for creation of **universal standards** which should be nationally recognized and accepted for e-publishing, for **development of homogeneous infrastructure for electronic access to academic information**: The

combined efforts of some of the Bulgarian universities and academic organizations in organizing the scientific knowledge in a digital form in a wide network of interconnected university platforms has led to the establishment of **the Bulgarian Virtual University (BVU)** in 2004. The initiative for creating an e-university in Bulgaria has been undertaken after the realization of two foregoing projects for establishing a **Virtual Chair in Computing** and a **Virtual Faculty in Information and Communication Technologies**. BVU has its local function within the country in collecting, organizing and disseminating the Bulgarian academic knowledge and its global aim is to integrate this knowledge through the **Virtual Euro-Faculty in computing to the GEANT pan-European data communications networks**, reserved specifically for research and educational use. There is already an existing plan for creating **regional virtual universities**, which will be constructed as Internet models in compliance with the real regional universities.

Some legislative regulations concerning the virtual educational databases were already introduced in Bulgaria, e.g.: Regulation for applying a system for accumulation and transfer of educational credits in universities, and Regulation for the state requirements concerning the organization and implementation of distant forms of education in universities. The copyright protection of those who are publishing in the virtual space (web-based teaching modules, courses and laboratories for example) is arranged with the copyright code.

