ICT in Educational Design

Processes, Materials, Resources

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01
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ICT IN EDUCATIONAL DESIGN – PROCESSES, MATERIALS, RESOURCES. THEORETICAL BASES

Abstract

To new and potential project participants, we want to present the most important theoretical assumptions that underlie the "ICTinED" project. The first part will present on the basis for the science of design in the context of the purposeful and creative educational activity in the following content areas: 1) definition related to the scope and characteristics of designing; 2) the process of satisfying needs related to the purposefulness of efforts; 3) solving problems in relation to spawning of ideas and creative success; 4) the process of designing in relation to ICT aided education. In the second part the basic theories of knowledge building from the perspective of cognitive sciences is discussed: 5) ICT as a valuable cognitive tool. The reflections indicate at methods of conception which condition "creative success" and efficient (in the spirit of praxelogy: practical, efficacious and economical) endeavors in the designing of didactic processes, materials and resources.

Key words: design process, creative didactic activity, ICT aided education, designing didactic processes, materials and resources, knowledge building theories.

02
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REMOTE ACCESS AND VIRTUAL MEETING TOOLS AS AN INTERACTIVE AND MULTIMEDIA TECHNIQUES USED IN THE TEACHING PROCESS

Abstract

Currently, we can observe self-learning as an increasing trend amongst young people. This situation is forced by the rapid development of technology and growing requirements of the labour market. Also the youngsters' mobility enforces them to rapidly learn foreign languages. Those are reasons why people are looking for remote ways of learning. Such approach is very convenient because of time flexibility, cost efficiency and place independence. This paper considers the general idea of the so-called distance learning. Firstly, the primary assumptions of such learning approach and its advantages and disadvantages are discussed. Next, the author describes the circumstances of emerging countries or disability cases in which such indirect teaching solutions are the most valuable. Finally, the possibilities which are given by modern software are investigated.

Keywords: distance education, remote teaching, on-line learning, utilization of ICT methods and tools.

03
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ICT EDUCATIONAL MATERIALS SUPPORTING THE INQUIRY-BASED LEARNING

Abstract
The initiators of education are continually seeking for new means that would enable the development of pupils in the context of current societal requirements. The article focuses on the broadening of theory of the inquiry-based education. It solves possibilities of the employment of information and communication technology for the support of pupils' inquiry activities. In connection to this, there is a classification of the digital instructional objects performed. Also a question of remote experiments is solved.

Key words: ICT, inquiry-based learning, educational materials.

04
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TESTING PUPILS' KNOWLEDGE THROUGH INTERACTIVE ELECTRONIC TASKS IN ELEMENTARY SCHOOLS

Abstract
The paper analyzes the current trends in testing and assessment of pupil's knowledge using electronic tasks and the use of electronic tasks in technical education in elementary schools. Authors describe a set of interactive electronic tasks designed for the formative assessment of pupils within the subject Technology in lower secondary education.

05
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E-SHOCK IN EDUCATIONAL CAREER COUNCELLING – REPORT ON THE FUNCTIONALITY OF THE PROGRAM

Abstract
In information societies (to one of which our contemporary adolescents undoubtedly belong), new communication technologies play an extremely important role in all walks of life, including professional development. In order to encourage pupils to make use of specialist assistance in the area of career counselling, skilful use of ICT tools in the counselling process has become indispensable. This article, which focuses on the e-SzOK program, consists of two components: 1) recommendations and initiatives undertaken by the Ministry of National Education and the Ministry of Labour and Social Policy with regard to career counselling in education; 2) the e-SzOK program in theoretical and practical dimensions.

06
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UTILISATION OF DATA MINING IN EDUCATION

Abstract
The goal of paper: the objective of this research study is to characterise the Data Mining method as one of the methods of knowledge acquisition and machine learning, to focus on Data Mining applied in the education area (Educational Data Mining), to conduct an experiment with the utilisation of the particular software, particular instrument and Data Mining algorithm focusing on specific problem in the education area. Methodology: the method of Data Mining in general and the method of Educational Data Mining are characterised using available published sources. The WEKA software, instrument Clustering and Simple K Means algorithm have been chosen as the basis for this experiment. The solving problem is related to further evaluation of research of the IT literacy in Slovak Republic. Results: the result of the experiment is the identification of groups with worse results in individual indicators of IT literacy and the proposal of the course of further education.

07
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INTERACTIVE METHODS INCREASING THE EFFECTIVENESS OF EDUCATION IN PHYSICS AT ENGINEERING AND TECHNOLOGY UNIVERSITIES IN THE SLOVAK REPUBLIC

Abstract

The paper deals with the use of interactive methods in Physics education at engineering and technology universities. Interactive method resulting from a year-long research at the Technical University in Zvolen with the main idea of interactive work with students via solving various problem tasks in Physics and changing the position of students from passive to an active one is described in the paper. The second part of the paper discusses the results of research into the use of interactive methods in Physics education at the Technical University in Zvolen.

Key words: Physics, Engineering and Technology Universities, Interactive methods, FCI, didactic tests.

08
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IMPLEMENTATION OF MODERN ICT IN TEACHER'S COMPETENCE – INPUT ANALYSIS

Abstract

The paper deals with the composition of ICT competencies of teachers in the context of the implementation of modern technologies. It presents the theoretical bases and related discussions regarding the readiness of teachers. The article depicts partial solutions and design research tools for a whole wider project – "Between Adoration and Resistance: Perceptions and Opportunities of ICT in Education from the Perspective of Teachers".

Key words: ICT teacher competencies, research, input analysis.

09
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PROCESSES OF EDUCATIONAL CHANGES AMONG SENIOR CITIZENS, RESIDENTS OF RURAL AREAS, IN THE PERIOD OF DIGITAL TRANSFORMATION

Abstract
The concept of Lifelong Learning is becoming a principal educational idea, in which the core point is shifting from educational institutions (teaching) to individuals (learning). During the technological revolution, which results in a digital transformation (ICT society) and globalisation there appear a number of factors, both supporting and hindering human development. One of the basic reasons for marginalisation of individuals and social groups in a post-modern society, which results in the lack of access to information and lack of competences that would allow accessing such information, as well as selecting or storing it, is the lack of media competences. Having analysed the implications of mass media (especially the digital ones) and the broadly defined electronic services connected with them, one cannot help but notice senior citizens. This social group is already a substantial part of the society and the consecutive demographic prognoses show that the ageing process in Poland will continue. Social activity, especially educational activity of the 50+ generation, is leading to cultural changes, as well as to differentiation of local societies. The results of own research presented in this publication aim, at least partially, at familiarising the reader with the current processes of educational changes among senior citizens, residents of rural areas, during the digital transformation.

Key words: educational changes, senior citizens, digital transformation.

10
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A MODEL OF THE CORE ICT COMPETENCIES OF TEACHERS IN THE EDUCATION PROCESS

Abstract
This article elaborates on the development of a model of the core ICT competencies of teachers in the education process. The three main groups of ICT competencies of teachers are formulated: (1) organizational competencies (OC), (2) technical competencies (TC), (3) behavioral competences (BC). The proposed model focuses on the approach of the use of a FAHP (Fuzzy Analytic Hierarchy Process) method for the creation of an objective value in regards to the qualitative and immeasurable competencies.

Key words: core ICT competencies, Fuzzy Analytic Hierarchy Process (FAHP), education process.

11
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OPTIMIZING THE SOFTWARE OF THE TRANSMISSION NETWORK SYSTEM LINE OPERATION

Abstract
This paper deals with the methodology of software to promote optimised operation of the transmission network. The methodology is based on the real data referring to operating temperatures and the power transmitted over 220 kV and 400 kV lines. This is an input database, formed by the values of power transmitted at a real time temperature. The software designed here offers a choice of the line to be observed with the option to set the temperature range. The produced outcome will comprise a graphic depiction of operation of the selected transmitter network line with respect to the power transmitted. The graphic depiction of operating course helps show the technical losses associated with the value referring to power transmitted. The methodology of this function has been simulated using an MS Excel sheet.

Keywords: Optimisation, technical losses, transmission network system, transmitted power.

12
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ECONOMICAL ISSUE IN EDUCATION AT PRIMARY SCHOOLS AND ICT USE

Abstract
Over the recent years, increased attention has been paid to economic education in the Czech Republic. The National Financial Education Scheme has been adopted, and economy has been widely implemented in the Framework Education Programme for Elementary Education. Apart from this, IT has become an indivisible part of elementary-school students' as well as teachers' lives. The present paper deals with the potential of ICT in teaching economy at elementary schools.

Keywords: primary education school, financial education, profession advisory, ICT.

13
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VERIFICATION AND APPLICATION OF THE NEW APPROACHES AND TRENDS IN TEACHING IN TECHNICAL EDUCATION. RESULTS OF RESEARCHES

Abstract

The article contains a complex overview of the pooled results, observations, experiences, and efforts as the projects outcomes were realized and researched by co-authoring with other faculties in the Department of Technology, Faculty of Natural Sciences, Matej Bel University in Banská Bystrica. The aim of this research was attributed to the innovative methods and their effective application in technical education and relates to the author's long-term interest in the problems of creation, development and application of innovative elements, modern strategies and creative teaching of technical education in Slovakia.

Key words: new approaches, digital competence, digital technologies, technical education, educational strategies, results of researches.

14
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SUN OBSERVING IN CONNECTION WITH SCIENCE AND TECHNOLOGY AS A TOPIC FOR PROJECT EDUCATION

Abstract
The paper deals with the issue of astronomical observation involving its applications in technological fields. This topic was chosen with respect to interdisciplinarity, potential to engage and develop the pupil's interest into deeper understanding of technological and physical principles. Pre-concepts of the pupils' views of astronomy being an isolated science is necessary to overcome. Astronomical observing focused on popularization enables to describe the issue of dendrochronology, climate changing, knowledge of spherical astronomy, time measuring, body moving and the other fields. We describe own experience with a certification of this topic.

Keywords: astronomy observing, popularization, dendrochronology.

15
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EDUCATING MANAGEMENT IN EDUCATION USING ICT

Abstract
The author characterises opportunities to educate management in educational institutions in this paper. The practical section of the paper covers the process of creating an e-learning course focused on school management.

Keywords: school management, e-learning, education, manager.