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CULTURAL HERITAGE STUDIES – THE NEED FOR A NEW INTEGRATED EDUCATIONAL APPROACH BASED ON VISUAL COMPARATIVE INTERPRETATION OF THE CULTURAL PAST

Abstract. The idea of this paper is to introduce a new "generation" of experimental educational integrated methodology, which is based on the presentation of cultural values in a three-dimensional environment – virtual reality (VR) and augmented reality (AR). The proposed methodology is aimed at the gradual creation of a new branch in the multidisciplinary collaborative learning environment as a part of the concept for the development of next generation integrated instrumentarium "visual comparative interpretation" in cultural heritage studies. This could make a substantial contribution in the area of applied research/educational methodology in the future in cultural heritage domain.

Key words: Education, Cultural heritage studies, Multidisciplinary collaborative educational environment, 3D Interactive models, Multimodal interaction

We are all convinced that one of the most important vocations for our professional community is to attract and concentrate public attention and to raise the awareness in the ongoing processes of irreversible losses of cultural heritage since it is being destructed faster than we imagine. Not only it changes and there is a danger that the next generations will see less than we are able to see now, but many not enough precise and misleading solutions and presentations are offered in the current IT-dominated part of the world. Therefore it is necessary to widen range over a large number of research quests in the direction of improvement of educational problems in scientific disciplines, dealing with cultural heritage.

The dynamic development of the modern world, caused by the fast global changes of the economic conditions and above all, by the wider penetration of the information and communication technologies in all spheres of life, call for a prompt reaction in the direction of the planning and immediate implementation of new educational methodologies in parallel with those which are currently in use, outlining new frames of education.

Of course that is comprehensive for qualification of specialists in the culture heritage sector. We are going to concentrate our attention at this point – where merging technologies opportunity gives us more complete and precise image of cultural heritage monuments. Now, with the technological progress, we have a chance to use better than ever complex solutions in the scientific based preservation process.

When we are thinking about the future of education as main factor in sustainable development, it is obvious that there is an enormous need for identifying the main

objectives by innovative approaches aimed at reconfiguration of educational methodologies.

I will mention some of the challenges we face at in the education field in general and especially in cultural heritage studies: multimedia environment, interactivity, collaborative environment, openness of education, quality of educational programs, optimisation of the learning time, according to the free choice of the both sides – flexible educational plans, individualised and user (student)-oriented (centred). New educational methodologies have to be directed towards the problem solving contextualization learning and correspondence of learning processes and future job requirements. The establishment of the information society and the knowledge economy it brings along require immediate action, corresponding to the degree of intensity of development of information and communication technologies, and determining the need of innovative solutions in the educational programmes in the sphere of scientific disciplines dealing with cultural heritage. There is an obvious necessity for urgent measures and adequate behaviour in unison with the **paradigm change from linear text to visually dominated society** in which the hegemony of images affirms itself with incredible speed.

Nowadays we face the enormous variety of problems in the border areas between various science fields in training of the staff implementing new technologies in everyday activities of the cultural heritage sector.

Thus, the speed of changes in the contemporary society demands new forms of applied research and educational methodologies in this field. One of the key elements in the methodology proposed is an integrated approach in the cultural heritage studies. The importance of educating university students who will work later in the cultural heritage sector becomes crucial, because as specialists they will bring the change in the sector in the years to come. We could imagine the way this proposed methodology could be implemented. To make possible future work in teams, the students will be trained to work in collaborative environment in which the proposed methodology envisages multi-access points contribution. The core multidisciplinary working group would be formed by the students in the Humanities disciplines connected with cultural heritage studies and another by those studying technologies and computer science. The first should be able not only to deliver content matching professional standards, but also to set up the framework and understand the changes in the ICT sector; the latter should be able to implement projects in practice understanding the problems of delivery of cultural heritage information based on a universal applied research common "language"– instrument – "Visual Comparative Interpretation" (VCI).

VCI is one of the promising methodologies, which is making possible quick evaluation of certain scientific theories. They could be used to approve or reject specific hypotheses, but their application covers more than this. The possibility to include various 'layers' presenting different field of study, or aimed at different target audiences, makes of them a powerful educational and applied research tool. The comparative visualisation methodology may be based on various technological approaches. Currently, the use of immersion-based environments of virtual reality (VR) and augmented reality (AR) are making possible the presentation of cultural heritage objects from the points of view of the various scientific domains which contribute to the research in the entire field.

VR/AR technology may shorten the distance between traditionally working researchers and the so called IT generation. The research strategies acquire new

dimensions and answer the challenges of new educational needs. The modern VR technologies are giving possibility to create mathematically precise 3D documentation which has the quality of scientific research model.

One substantial contribution of the methodology is assisting for relativisation of knowledge about much more complete image of certain represented historical events.

Towards a new educational approach based on visualisation in VR/AR environment

The **aim** of this précis is to raise awareness of the importance of the gradual creation of the new integrated educational methodology based on comparative visualisation – **"visual media comparative interpretation of cultural heritage".** The proposed instrumentarium could give us a new exceptional opportunity for the creation of new generation of applied research instruments encompassing the contact zone with the past. Careful observation of the contemporary trends shows the necessity of enriching the educational methodologies in the sphere of the branches of knowledge which are entirely or partially dedicated to the study of the cultural past with innovative educational instruments based on the generation of three-dimensional virtual models through "virtual interpretation" in a multidisciplinary centred network learning environment. More specifically, it is a matter of the creation of a new branch in integrated multidisciplinary environment uniting the applied research of:

– the **branches of knowledge** which are entirely or partially dedicated to the **study of cultural heritage**: history, cultural studies, anthropology, ethnography, architecture (especially module reconstruction), art history with an accent on the history of the technologies for creation of cultural monuments and some new complex disciplines like preservation of cultural monuments, and especially the so called archeometry, etc

and

– the **sciences connected with the creation of virtual environment** (computer sciences, psychology, especially perception psychology) and some engineering sciences (mechanics, optics, electronics, acoustics, etc.).

In support of the above proposal we will mention only some of the basic accents underlying my completed conceptual **study "Visual Interpretation – a New Generation of Educational Instrumentarium in a Multidisciplinary Centred Network Learning Environment for the Enlarging of the Contact Zone with the Past"**, as a part of presumable future development of e-Science. It is a proposal for the introduction of a new generation of experimental educational methodology with generation and perception of cultural values in a three-dimensional mixed environment – virtual and augmented.

The Visual comparative interpretation (VCI) could be best described as an extension of applied research methodologies from the following fields:

- New/innovative learning methodologies/motivation.
- Integrated multidisciplinary approach.
- Real time VR/AR interaction in research environment.

The idea for creating a conception of adequate methodology is based on the obvious necessity for concentrating our efforts of creation in stages of a vision and strategies for further development of educational and research environment in the

cultural heritage studies. I would like to mention some important issues which we should have in consideration in the process of creating detailed construction for the methodology proposed:

- **Integrated multidisciplinary approach in the framework of future e-science orientation**

Creation of a new branch in multidisciplinary learning environment uniting the achievements of applied research on:

– Branches of knowledge which are entirely or partially dedicated to the study of cultural heritage: history, cultural studies, anthropology, ethnography, history of the architecture (especially module reconstruction), art history with an accent on the history of the technologies for creation of cultural monuments and some new complex disciplines like preservation of cultural monuments, and especially the so-called archeometry, etc.

– Sciences connected with the creation of virtual environment (computer science, psychology (especially cognitive one with accent on the problems of perception) and some engineering sciences (mechanics, optics, electronics, acoustics, etc.)

and

– Pedagogical sciences.

The integrated multidisciplinary learning environment could be viewed as a basis for stimulation of the acquisition of knowledge that has so far been in the periphery of the students' range of vision, and, as a whole, could serve for the formation of a strategic resource for creative solution of emerged problems. The students participating in such a project could form a vision for their own future development more quickly, and turn more successfully to those training and knowledge-acquiring frameworks that would serve them best in their future professional development. They will be able to cope more easily with changes in their future work and to be more flexible in situations, requiring non-standard orientation.

- **Integrated collaborative learning environment**

Work in a multidisciplinary-based collaborative learning environment allows for better motivation, better mastering of the material and better professional performance in the future, perfection of communication skills and placing the group relations on a new level. Very important characteristic of the methodology proposed is using on multiple access points, which will contribute to master skills for team-consolidation, for creative work in the conditions of multidisciplinary centred network learning environment and effective use of interactive teaching methods.

Collaborative learning environment will stimulate optimal conditions for objective appraisal of one's own resources on the basis of mutual evaluation and recognition of professional qualities. Such an environment will support a faster adaptation to the dynamic change of working forms with a view to the tendency for **distant team work**.

- **Based on emerging technologies (with an emphasis on VR and AR Technologies)**

Undoubtedly VR and AR as well as established more and more mixed reality technologies are giving unique opportunity for creation of relative authentic image/panorama for perception of the historical environment of cultural heritage monuments from the time of their creation or a particular historical event.

- **Anthropologically Centred Approach**

The broadening of the scope of the anthropological research in the recent years definitely shows the necessity of the use of anthropologically-centred approach n the cultural heritage studies. We are going to mention some anthropological aspects of the everyday life which should be considered:

– Human dimension/measurements
– Human presence in the virtual environment (VE) presenting historical issues.

This idea was developed in several projects. People are being dressed in historical costumes, corresponding to the presented historical period, which is visualised. Their images appear in the group of participants in mediaeval ceremonies. Their face and body are being animated exposing mimics.

– Agents: human-like communication

♦ **Quality of educational materials**

In creating educational programs first of all we have to be very precise in the fulfilment of the quality requirements. The opinion that the quality of **educational systems** should be raised, attracts strong public support and becomes more crucial for the further development of enormous increase of educational needs of the society. An important feature is the ease of **access to high quality information**. These are centred on the creation of environments contributing to the acquisition of scientifically based educational materials, which could be used in cultural heritage sector in **Life-long education** (LLE) domain too.

♦ **Necessity of investments on human resources**

It is not necessary to convince specialists that the most valuable investment in the future is the investment in the education of the young people. They are caring new visions which will contribute for the sustainable development of our society.

♦ **Implementation of innovative approaches in teaching and training**

Elaboration of effective training methods and their implementation will contribute for enlargement of knowledge space with an accent on its practical applicability. Implementing of innovative approaches is important for the better preparation for key or unexpected changes in the future profession of students.

♦ **Learners-Centred Education**

One of the aspects which need to be thought over is the placing of the learners in the centre of the process, i.e. the achievement of student-centred education. There is a need for implementation of an individual approach, teaching methods comparable to prior teaching and learning methods in order to avoid a decrease in motivation and using the students' experience with a view to the acquisition of more complex knowledge.

♦ **Correlation:** "**Education – Future professional realisation**" / **Contextualization**

One of the very important issues which we should have in mind speaking about the future development of new educational programmes in cultural heritage studies is that we should be able to shape analytical skills and abilities for creative imagination and at the same time visual way of thinking for their future fast changing work environment. Already in very early stages of their education, they have to become tasks for attempting problem solving. Skills for better presentation and problem solving, cropped up during the process of realization of the working project are essential. It is especially productive to start a team-initiated project by discussion and collective definition of its goals, allocation of responsibilities and creation of appropriate working climate. It is very important the creation of prerequisites for the formation of non-standard conceptions on the basis of the favourable conditions for creative expression in

the conditions of the learning multidisciplinary environment. Creation of conditions for the building of a research attitude in the young, which would contribute to the formation of skills, allowing the students to outline the configuration, framework and volume of the working project themselves, to find strategies for its successful realization on their own. An especially important element in the learning process is the ability to conceptualize the information and to define ideas and turning of the worked-out conception into a plan of action. The proposed methodology will assist personality development.

One of the important tasks of the proposed methodology is to stimulate the potential development through **creation** of conditions for the building-up of **professional confidence** and objective appraisal of one's own resources on the basis of mutual evaluation and recognition of professional qualities. Such an environment will support a faster adaptation to the dynamic change of working forms with a view to the tendency for distant team work. As a part of the project implementation would be a benefit a research about the expectations of the participants in the experimental project to be made.

In practice, the creation of the proposed educational integrated multidisciplinary environment methodology requires the carrying out of a feasibility study of the project and the **setting up of an experimental laboratory**, which would serve as a basis for the successful realization of the proposal.

We are facing at detailed working out of all elements of the idea proposed and its` experimental implementation in University environment. I am convinced that only with continuing research efforts and testing of different (sometimes not full convenient at first glance ideas) we could reach optimized results in searching working educational methodologies for the future and the future will be such as we build it.

This paper is a part of a book under preparation.

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