DEVELOPMENT OF E-RESOURCES FOR TEACHERS WHICH APPLIED HANDS ON METHOD IN PRIMARY SCIENCE EDUCATION IN SERBIAN SCHOOLS

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Abstract

One of the principal aim of our action is to provide Serbian primary school with as much as possible books and an Internet network, enabling the teachers involved in Hands on (in Serbia Ruka u testu) to link up with one another, and also linking them with the world of research (scientific from research Institutes and University). The target groups are: teachers in Serbian Primary schools, professors of sciences in Secondary schools, parents as well as all others interested for science education. The main activities will be translation of French La main à la pâte permitted texts, make it available on the site Ruka u testu, and make the network of scientific consultant and teaching specialists, education for teachers which will use these e-resources.

Key words: e-resources, Internet, Ruka u testu, Hands-on

Introduction

In a number of countries (USA, Hands-on; France: La main à la pâte; Sweden: NTA; China: learning by doing…), a renovation of science education strongly supported by the Academies of science and the scientific community has been launched in the last two decades based on the principle of an inquiry-type teaching (building of hypotheses, experimentation, team-work and written expression). In Serbia, the project Ruka u testu, like in others European countries and mainly in France, “has a general idea to cause children to participate in the discovery of natural objects and phenomena, to bring them in contact with the latter in their reality (outside of virtual reconstructions), directly through observation and experimentation, to stimulate their imagination, to broaden their mind and to improve their command of the language”, or we would like to help our children to achieve scientific literacy and on this way preparing them for the society based on science and technology. We are supported by VINČA Institute, Serbian Academies of Sciences and Arts, Home edition “Zavod za udžbenike”, Education weekly journal
“Prosvetni pregled”, Ministry of education and sport, Ministry of sciences and environment, French Embassy, Serbian Physical Society, Euroscience for Serbia. Therefore, our project is in synergy with all above-mentioned projects and promotes EC cooperation and cooperation in South-East Europe. One of the proofs are three South-East European Summer School for Hands on Primary Science Education [1]. The specific objective of our projects is to make available to teachers on the site Ruka u testu translated and accommodated texts, which will help them, now and in the future, in an inquiry-type teaching sciences and technology in Serbian primary schools.

Figure 1. Serbian teachers on South-East European Summer School for Hands on Primary Science Education, Belgrade 2006

**Justification of our activity**

Convinced of the positive impact of Hands-on scientific education as early as in kindergarten and primary school, our PROJECT is fully coherent with the three objectives:

(a-1) The PROJECT will improve the efficiency and the competitiveness of Serbian primary schools.

e-centre, created in VINČA Institute, will strengthen the communication and dissemination of the initiative that might become the future European interface for communication on science education and future developments at the local level i.e., the competitiveness will be improved. The diffusion a set of content and training modules that the teacher may apply in science education will be realised by
more frequently use of existing computers and asked for new one in our primary schools (It is known that only EAR in Serbia has give 1 000 computers for Serbian schools), i.e. the efficiency via using IT will be improved.

(a-2) The PROJECT will improve the capacity of our education systems to innovate through the adoption of Hands-on method not only by generation of texts, books, experimentation packs, as was up to now, but also by using IT through creation of the site Ruka u testu.

(a-3) e-centre in VINČA Institute will providing support for innovation in Serbian primary schools by amplify the added value of the exchanges, common methodological and organisational schemes, such as tools for teachers, e-activities, evaluation and dissemination resource, etc.

(b) The PROJECT is fully coherent with:

- Promoting co-operation and clustering in the area of innovation: because the idea of Hands-on method is based on the cooperation of scientific institute, university, schools, locale society. The site Ruka u testu which has three sections (information, resources, exchanges) has also several attached network. The Ruka u testu network: a Serbian national site which display resources translated from the French La main à la pâte national site, locally produced resource and general information. For this task we must create the network of scientific consultants: researcher and engineers which will verify translated resources and answer science questions raised by teachers. The network of training officers/teaching specialists: questions on teaching and education are dealt with here.

- Provision of specialist innovation support and knowledge-intensive services, the site Ruka u testu will be the first Serbian knowledge-intensive service with information and resource on latest pedagogical method on science and technology based on Hands-on education in primary schools in Serbia as well as in Europe.

(c) Identification of perceived needs and constraints in the target area – what evidence is there to support this perception?

Our teaching, in Serbia as well as in Europe, is, as said Pim Levelt in Science is Primary, Amsterdam, 2004, [2] “traditionally not or not enough inquiry-based. The child is not enough challenged to ask questions, to be imaginative, to propose solutions, to find evidence, to verify, to cooperate in solving problem, to build and construct. We want our kids know as soon as possible; we are not willing to reward them for a creative step which happens to lead nowhere”. It is very important that all over the world (US, Chile, China, Europe…) initiatives be taken to change something. Serbia participates also in this initiative because we have also the same problems in teaching science in primary school. We have identified it during many seminaries, which we have with Serbian teacher all over the Serbia.

The Serbian schools are lack of necessary laboratory equipment and good WEB-site pages on Serbian language. According to the results of active teaching ap-
proaches (like in the world-wide spreading program “Hands on” (in USA),” La main a la pate” (in France), Ruka u testu (in Serbia) the best results are obtained when teaching is accompanied with experimental demonstrations and exercises, and Internet. For implemention of such approach, commonly adopted in developed countries, we have developed very intensive collaboration with French Academy of Science team “La main a la pate” with hope that in the near future we will achieve

Specific objectives

To raise the quality and effectiveness of the teaching provision and learning process in primary schools in Serbia.
To enable teachers to apply modern didactic methods.
To facilitate acquaintance of pupils with sciences and technologies.
To get closer to European and world standards.

Anticipated impact

Instant rise of quality of existing teaching practice in primary school.
Instant rise of pupils’ and teachers’ motivation.
Facilitated implementation of modern teaching methods adopted in developed countries.
Rise of pupils’ individual interest, comprehension and skills in science and technology.

Detailed description of activities

First of all we will start with the integration of the French Site www.inrp.fr/lamap for the Serbian version.
– The French Academy of Sciences with La main à la pâte team will give us this Site for translation on Serbian language. The contract between French Academy of Sciences – Serbian Academy of Sciences and Arts – VINČA Institute of Nuclear Sciences will be signed during the 2007.
– The Translation and accommodation of documents from the French site www.inrp.fr/lamap on Serbian language is up to now very successful because we have more than 900 pages: Project Eratosthenes (80), Discoveries in Europe (350), Two pedagogical books for teachers (200), Modules from French Site (200), Presentation of South-East European Summer Schools for Hands-on method and some articles in Education weekly journal.
– The accommodation for Serbian version will be made, as to now, by scientific consultants and teaching specialists which will be in the same time the members of two networks: teaching specialists and scientific consultants;
– The project manager is responsible for this activity and finally for the creation of Serbian Site http://rukautestu.vin.bg.ac.yu in e-centre VINČA
The creation of two networks: teaching specialists and scientific consultants;

- The scientific consultants will be the professors from different Universities in Serbia and the researchers from VINČA Institute (for a moment) which have participate as consultants during the translation of books for teachers which applied Hands-on method in science education in Serbian primary schools. The scientific consultants will answer on questions from their scientific field raised by teachers. The questions and answers will be collected by IT persons in e-centre Vinča and put on the site Ruka u testu.

- The teaching specialists will be among 10 Serbian teachers and experts who are in French schools on 4-days seminars in International Pedagogical Research Institute (INRP- Sevre) and other teachers from all over the Serbia which have good results in implementation of Hands-on method in Serbian primary schools. The teaching specialists will answer on pedagogical questions raised by teachers and help them in direct communication in corresponding region. The questions and answers will be also collected by IT persons in e-centre Vinča and put on the site Ruka u testu

The implementation of Hands-on method science education

Implementation of Hands-on method science education in primary school can be realised only if Serbian teachers have a permanent education and resource for active learning. For that reason we will:

Utilise their existing skills and experience:

(a-1) Teachers from primary schools utilise existing skills in Hands-on method developed by the application of 9 books [3-11], which are translated for them in the frame of the project Ruka u testu, 5 very important supplements in Education weekly journal [12], and more seminars which have been organised for them in almost all Serbian regions (with participation of more than 1000 teachers, 300 students of the Faculties for teachers, professors of sciences in primary and secondary schools) and VINČA Institute.

(a-2) They use also their own existing experience in a simple experiments led

Figure 2. The books for teachers and parents on Serbian language
by the children in small groups by using everyday materials around them, the results of experiments even fail are described in an experiment notebook.

Figure 3. Belgrade’s Primary School “Užička Republika” have participate in the international project Eratosthenes. This is their Postcards send by Internet to other participants

(a-3) By our estimation, during the seminars for teachers which applied Hands-on method in science education, only about 5% of Serbian teachers use the computers for a preparation of lectures from science. For that reason they need a very good site and short education seminars about using the Internet. We have good experience in creation of CD for more scientific conferences and we will applied it in this case by creating the CD version of the Site Ruka u testu..

The seminars for the teaching specialists and teachers

- Three-day seminars for the teaching specialists will be organised in e-centre VINČA and during the Third Summer School for Hands-on Science Primary Education, Serbia, October 2007;
- the lectures will be give by the experts from the French La main à la pâte team via visio conference and the scientific consultants and teaching specialists;
Two-day seminaires for the teachers, in the e-centre VINČA or in the some of Serbian regions, concerning using computer and the Site Ruka u testu like the resource for Hands-on science education in Serbian primary schools;

- The seminaires will be gided by the scientific consultants and teaching specialists;
- Teaching specialists will help us in each region during the organisation of seminaries for teachers which use Hands-on method in primary schools.

Conclusions

After this activity, in permanent connection via Site Ruka u testu, where it is technically possible, or by using CD version, our teachers will be capable to start to use the computer, more than before, as a help in education and will be in connection with their colleagues from Serbia and Europe, scientific consultants, and teaching specialists. The possibility of participation of primary schools, from each part of Serbia, in the international projects like Eratosthenes, European Discoveries, etc., will be more easily. The original teacher’s pedagogical innovations will be translate and put on the Site Ruka u testu. We will continue our fruitful South-East European and other international cooperation.

References


