PERSONALIZING E-LEARNING CONTENT QUICKLY AND EASILY

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Introduction

In recent years, the process of creating educational e-learning content in Slovenia has been carried out for the most part with disregard to the teacher, thereby introducing a two-way relationship between the authors and users of the content, i.e. students. In projects "Learning Programming" (Lukšič, 2009) and "Active Mathematics" (Lokar et al., 2009), which were done in scope of the public call of the Ministry of Education and Sports, we therefore gave emphasis on the preparation of materials that can be modified and combined into new content. In this way we tried to transfer knowledge, acquired over the years in the field of preparation and use of e-learning materials (Batagelj et al., 2007 and 2009), i.e. that the teachers want content that can be easily adapted and reused for their own purposes, to practice.

The manual for teaching staff of the Institute for Interactive Media and Learning University of Technology Sydney (IML, 2009) states that one of the important characteristics of a good teacher is if he or she uses the learning materials in a manner best suited to the course, which he or she is currently teaching. Also, a research done in South Korea (Hwang, 2008) on teachers' satisfaction with e-learning content, gave interesting results. It showed that one of the main factors that affects satisfaction with the content and hence its actual use in the classroom is the possibility that this content can be adapted to the method of teaching.

Therefore, our project group conceived an idea to allow the combining the existing content and with that the creation of one's own learning pathways. With that we wanted to tackle the following problems associated with existing e-learning content:

- Often it is realized as digitized books.
- It has no contextual dependencies, which are useful when we want the learner informed about his mistakes and the consequences resulting from these errors.
- There is insufficient use of new teaching approaches (students will often use the content when a teacher is not present, therefore the concept of multiple interpretation of the same topic is very important, as well as the motivation, progressive building of knowledge, examinations, etc.).
- Instructions for the teacher are missing (how to present the material, what is the goal or purpose of the content on each step, etc.).

However, we also found certain shortcomings in our approach, mainly through reactions of the teachers. It is true that they got the opportunity to combine and adapt the learning content, but it was a quite difficult process. It required knowledge of online classrooms, HTML, SCORM, etc. We have also found out that it is not enough to offer only content; we also have to insert it in the appropriate classification system and interlink it.

Furthermore, it was a mistake to expect that teachers will only use the materials. They also had didactic and technical comments as they were the ones who used it in their classrooms. However, the biggest surprise has been that the majority did not want to create new content, but to adapt the existing one. Whether this was due to lack of motivation, the complexity of the process or the lack of quality content, it was necessary to find the problems and fix them.

Advanced learning blocks

With the aim of eliminating the aforementioned problems we formed the group NAUK - advanced learning cubes (Lukšič et al., 2009), which continues to build upon the paradigm that has been presented. The idea can be compared with the popular Lego blocks, as the basic requirement is that authors offer: the basic building blocks, already designed content, which can be adapted, and plans (instructions) for the manufacturing of new content. The projects in the context of NAUK group are involved in making content for high-school mathematics, logic,

physics (primary and secondary schools), and computer science (all levels). This promises a greater range of users but also gives us a greater responsibility.

It was therefore necessary to provide possible scenarios of use and then address the construction and upgrading of the content. When preparing the content, it is important to take into account its entire life cycle. This includes the process of creation, use and alteration of the material. The whole process of managing e-materials is well described in van Assche and Vuorikari, 2006, from where Figure 1 is taken.

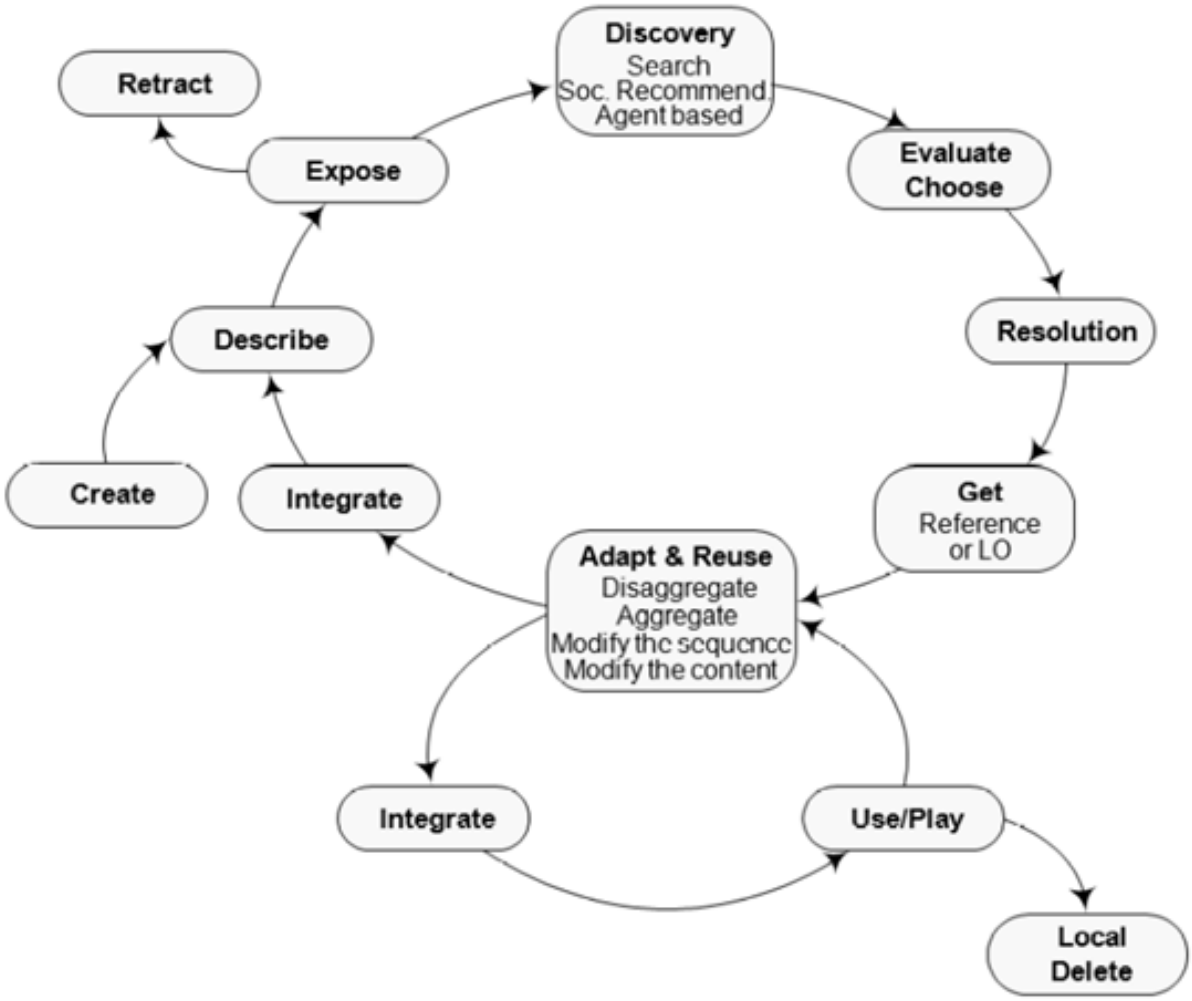

Figure 1 The life cycle of an e-learning content.

The lack of tools that are easy to use, while enabling the functionality we need for quality education, and technical knowledge that is necessary for the implementation of electronic-based education, are the main obstacles today in Slovenia that make the wider use of e-learning in the school environment as well as outside impossible.

Tools for content creation

The selection of correct technologies and tools, and the establishment of a functioning environment for producing e-learning content are essential to ensure basic support and the popularization of e-learning. Of course this is not a task for the teacher. Creating an environment that will offer quality e-learning and related services is the goal of the project e-Sigma, where we intend to offer technological support to created materials in the context of projects NAUK.

The main component of the proposed services is the repository of materials, which, unlike the multitude of existing systems, is not only intended for archiving content, but offers the possibility of combining existing

materials into new learning units. Sustainability and reusability of materials in light of new technologies is the main advantage to the existing monolithic e-content we currently meet all over the web.

What follows are just the main scenarios that we envisaged when using the mentioned repository:

- A teacher needs a learning path, i.e. a complete learning course for teaching specific topics in the curriculum.
- A teacher that uses an online classroom would like to create an assessment.
- A teacher wants to prepare homework with the same content but with different data for all students.
- A teacher would like to use an already prepared assessment.
- A teacher would like to contribute his or her own content into the repository.
- A teacher has an idea for new teaching materials.

Since we wanted to simplify writing and adding of interactive elements, we decided to use a similar syntax used by the wiki environments, e.g. by Wikipedia. Of course, our syntax contains additional tags, thereby enabling the addition of various multimedia elements, links between learning materials, responses to user input, etc. Example of the syntax is shown in Figure 2. In the continuation of the project we intend to offer a graphical editor to replace the writing of tags.

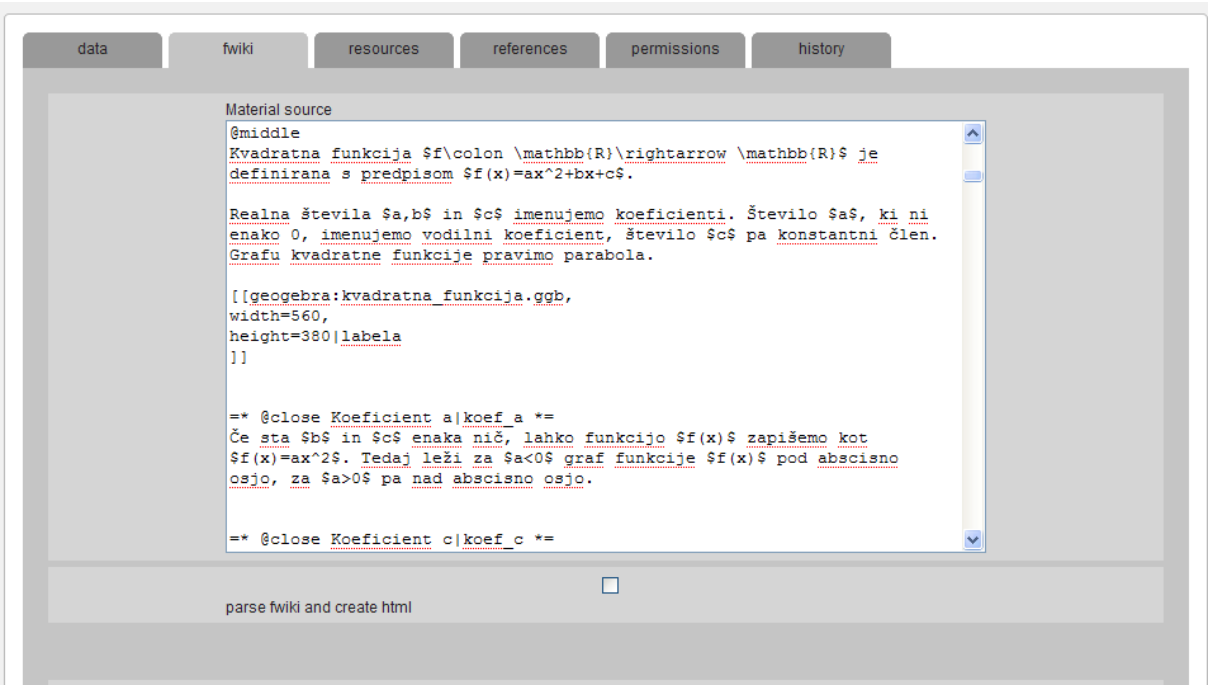

Figure 2 Example for the writing of the content, which is similar to the wiki syntax.

The teacher will be able to take content from the repository, amending or supplementing it, and immediately post it on the portal or export and use it in their own online classroom. This will remove the requirement for technical knowledge, which is usually necessary to change the materials in the form of SCORM. Thus, the teacher will no longer be obliged to follow only the ideas of the original authors of the content, but will be able to accommodate the content to his or her needs. He is she will be able to:

- take a few questions from existing quizzes, then put them together to built a new quiz,
- take an already built a learning unit, remove or replace a certain section, change the order of two chapters, etc.,
- correct an animation or add his or her own example,
- build a test from a database of questions, where the selection of the next question will depend on the correctness of the answer to the previous question,
- add leaps in a learning pathway and thereby build a non-linear structure,
- add feedback depending on the correctness of the answer to a question, etc.

In addition to these possibilities there exists a system that determines differences between documents, leading to version control of the stored content. So, in the case of an error, we can simply select the older version and continue working. It is also possible to allow colleagues to work on your own material. Furthermore, any material is equipped with metadata, which enables us to classify the materials with regard to the curriculum. Often overlooked feature needed by repositories are good search engines. This does not mean only search by title and content, but also by type of materials, their purpose, scope, popularity, etc. This is precisely the problem of the current Slovenian educational network - SIO (Čač et al., 2007), which is being filled with an increasing amount of material but has problems when searching for specific content due to the lack of correct classification. We are therefore forced to review a great deal of content on the same subject to see that some consists only of a single pdf document, others are learning paths, the third kind links to other places on the Internet, etc.

Authors are already making materials in e-Sigma repository in the context of the projects NAUK. Although we are adding new functionalities, the form of the content is largely fixed, which means that teachers do not have to worry about the appearance, but only about their content and its place within the learning path. Example of an exercise can be seen in Figure 3 and is generated automatically when the teacher enters the type of items that he or she wishes to have, e.g. some text, matching question type, hint button with text for the hint and the jump button.

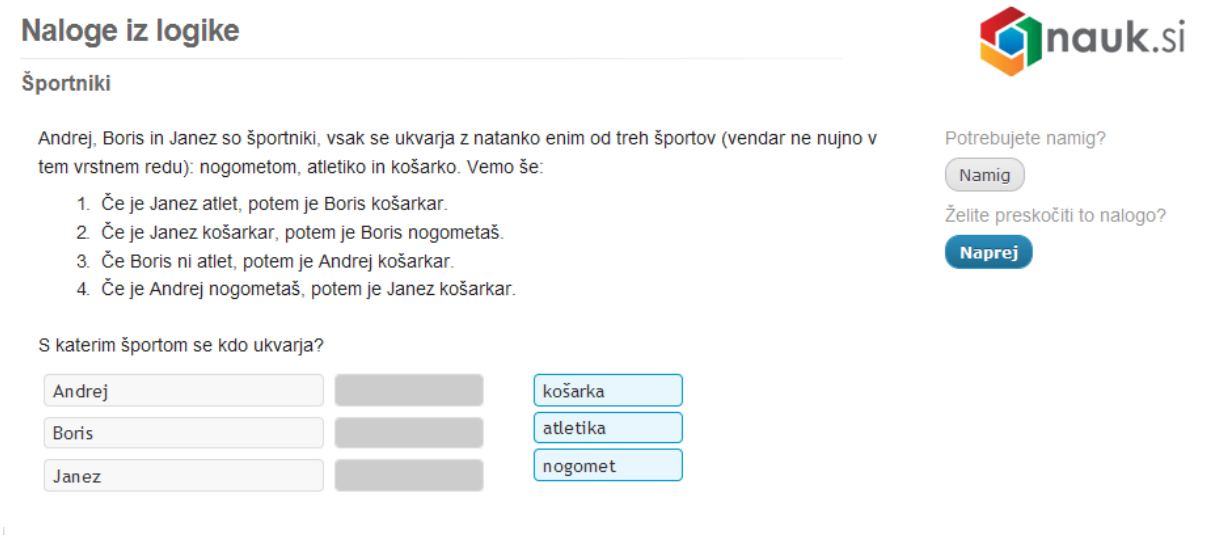

Figure 3 An exercise from logic built automatically by the e-Sigma system.

Further work

Informal interviews with many teachers as well as the first reaction of users have shown that this is a good approach and will allow higher quality of teaching. We determined that it is wise to invest further efforts in this concept. Therefore, we intend to build a Web community where it will be possible to give opinions and comments on existing materials. We also discovered that the teachers also wish to publish their materials, and many of them have ideas but lack the time or knowledge to realize them.

Since good ICT solutions in the field of education spread quickly (Beyond Textbooks, 2009), we hope on the success of the presented solutions, but also are aware that further development in this area relies heavily on the end-users, i.e. the students.

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