

# Comprehensive Analysis of E-learning Systems Compatibility and Solutions

Tomasz Makowski, Bartosz Sakowicz, Michał Wojtera

**Abstract** – The aim of the research presented in this paper was to analyze different e-learning solutions and compare them in the field of functionality and standards compatibility. As most popular applications Moodle, WBT and EXE programs have been chosen. The possibility of export/import courses between them has been discussed.

**Keywords** — e-learning, SCORM, Moodle, WBT, EXE

## INTRODUCTION

Competences, knowledge and information are the key elements in the process of “information society” development [4,5]. Majority of developed countries go towards “based on knowledge economy”. As a result information and knowledge are key intangible assets in many enterprises. It has a great impact on techniques and information systems used in education as well as on the development on new learning forms. Lifelong learning, which seems to be dominating way of people development, requires more creative and elastic teaching forms. It also requires teachers to adjust to the specific type of knowledge acquisition as e-learning systems are. In the recent thesis systems used in e-learning solutions were discussed. Among the major advantages of e-learning systems are: educational cycles can be made from many courses (or lessons), the courses consist of more simple teaching computer units (AU). Each of elements mentioned above could be created in different time and place, by different authors and in separate technical environment. So as to made all the elements working altogether and to cooperate properly as well as to meet customers’ quality criteria, systems, in which these elements works must have implemented service of specified standards of packaging, communication and meta database. Systems, which do not meet specified standards can not realize functions of courses substitution thus it distributes and replays materials made itself only.

## SCORM STANDARD

SCROM standard has an ability to import block of courses made by external author’s tools, only when (as it is described by the name of module) they are complied with SCORM specification (ADL initiative) [6]. The standard provides the transmission of teaching input between systems made by different producers and enables multiple usage of separate parts of course. The usage of SCROM helps to avoid high costs of the courses service.

---

Tomasz Makowski, Bartosz Sakowicz and Michał Wojtera are members of Department of Microelectronics and Computer Science, Technical University of Lodz, Poland  
e-mail: tomasz-makowski@wp.pl  
sakowicz@dmcs.pl  
mwojtera@dmcs.pl

SCORM format is based on import and make accessible e-course, which was made earlier and is compliant with SCORM standards. The format does not have functions of adding different types data stocks.

## MOODLE APPLICATION

Moodle uses many forms of communication, technologies of data acquisition and knowledge checking but it does not limit own invention of the user. Moodle can be broadly used, besides it is open source tool, which makes it more and more popular. That makes Moodle being still improved and new functions are added too [1].

After defining the level of authorization and after choosing the format the user can start working on substantial input implementation. Teaching materials, which can be used here were divided into resources and activities. Resources are meant as accessible methods of the information presentation: Insert a label, Compose a text page, Compose a web page, Link to a file or web side, Display a directory add an IMS Content Package (Fig. 1).

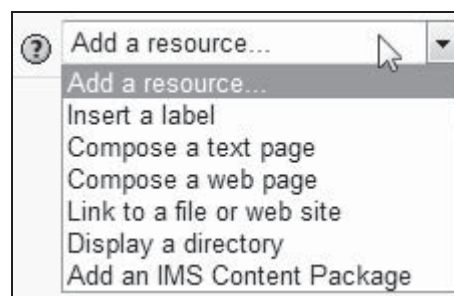


Fig. 1 Adding a resource in Moodle

Moodle has some additional modules, which enable common work on document, publication and the access to the document by defined users, ability to implement additional security (SSL), external verification of users’ accounts.

In practice import/export activities on Moodle platform are:

- Data backup – the process starts with choosing the elements, which will be included in backup copy. It is worth mentioning that export possibility are wide because there is the possibility to export files, information related to course (which includes information on personal data of course participant). In the last step of backup creation we receive final information, which is compressed file (Fig. 3).
- Regeneration of backup (Fig. 2) – the process starts by choosing compressed file (where there is a backup copy of specific course). It is worth saying that in Moodle there is a possibility to add new information to regenerated copy or to made a new course. The key stage of course regeneration is the choice of localization and elements’ definition, which will be implemented in new course.

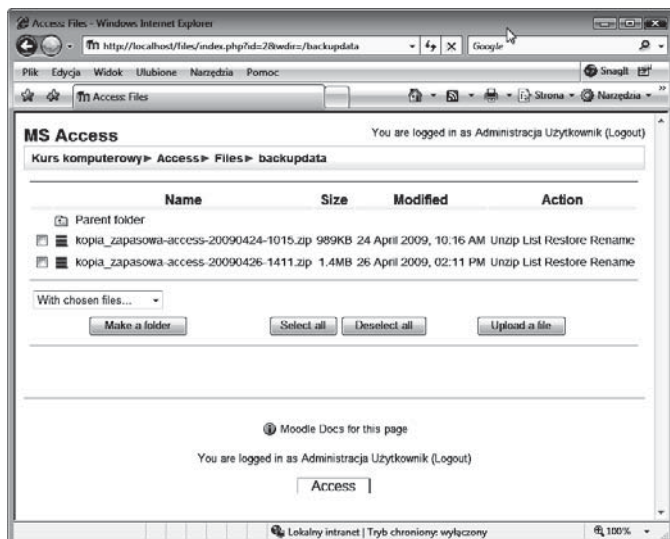


Fig. 2 Regeneration of backup in Moodle



Fig. 3 Choosing the elements in data backup in Moodle

In Moodle platform it is possible to import/export data in the range of specific course. In particular:

- Grades export – the possibility of export the list with grades to Excel or to simple text file;
- Import of other course elements – Moodle enables the possibility to include elements from ready courses or from new courses;
- Import of scholar group – the function supports mentor's work.

All described Moodle's features increases system popularity. It worth observing new versions of Moodle to check whether programmers involved in works on Open Source systems (as Moodle is) will go towards higher interoperability of these systems.

Wide usage of Moodle is confirmed by the number of programs, which can be implemented to that platform, like: WBT Express for Moodle

## WBT APPLICATION

WBTEExpress is a tool o create courses and exams [2]. There are several versions of the program – from simple (for free) to very complicated, which gives a chance to use many embedded functions.

WBTEExpress includes base for many components, which can be placed in the course very simply. The program enables to convert presentation made in PowerPoint to WBTEExpress format. Thanks to WBTEExpress it is possible o work in a group. Major advantages of the program are: ready templates of pages, ability to define style on pages, quick access to each element's feature, export of course to different formats, stability, possibility of page preview, multilingual interface.

After adding graphics or exercise elements to the course the user has the ability to export course and publish it in one of worldwide standards (Fig. 4). Program WBTEExpress offers following types of export:

- 4system WBTServer,
- HTML – offline courses,
- 4system WBTExplorer (EXE),
- SCROM .2 IMS 1.1 I 2004,
- AICC HTTP (HACP),
- Oracle iLearning,
- Graphic elements of presentation.

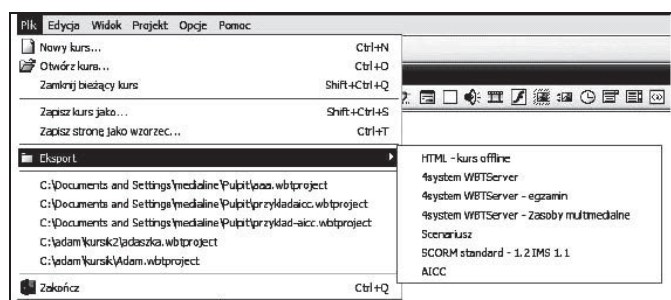


Fig. 4 Export files in WBT program

## EXE APPLICATION

The third application, program "eXe" uses authorized applications and other Internet contents as the help in creating the teacher of e-learning stocks without the knowledge of xhtml language (the user can save internet page or to export it to SCROM standard) [3].

The eXe program is Open Source authoring application. It isn't complicated; making a course is skillfully, menu and available components are constructed readably (Fig. 5).

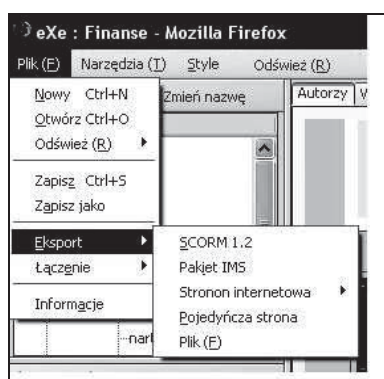


Fig. 5 Export possibilities in eXe

## CONCLUSIONS

High export possibilities supports course's broad operational – e-course, which can be exported by many ways and cooperate with more systems.

It has to be said, that each of e-learning system should go towards full interoperability. It will improve the efficiency and reliability of the platforms and will improve the communication between them.

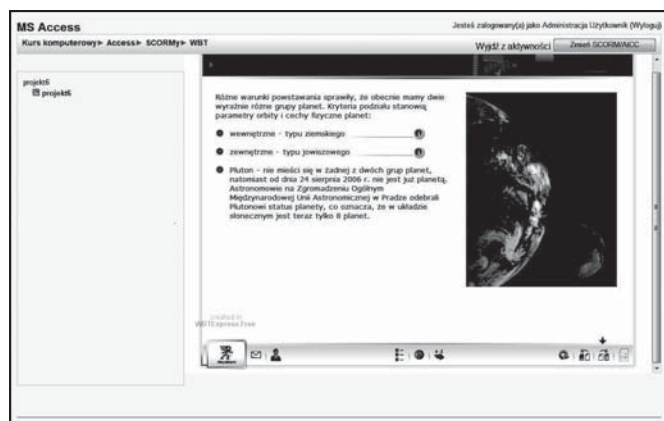


Fig. 6 Course form WBT moved into Moodle

As a results of tests the authors made it can be confirmed possibility of courses' transfer between SCROM systems (Fig. 6-7). However we should not forget that success of unification depends on programmers. Sometimes they do not give the access to export function to SCROM (as it was in case of Moodle). The import is not offered by eXe and WBT. However in case of WBT this option was enable in higher version of the program – commercial one. It must be also

highlighted that all tested programs had the ability to save courses to its own format.

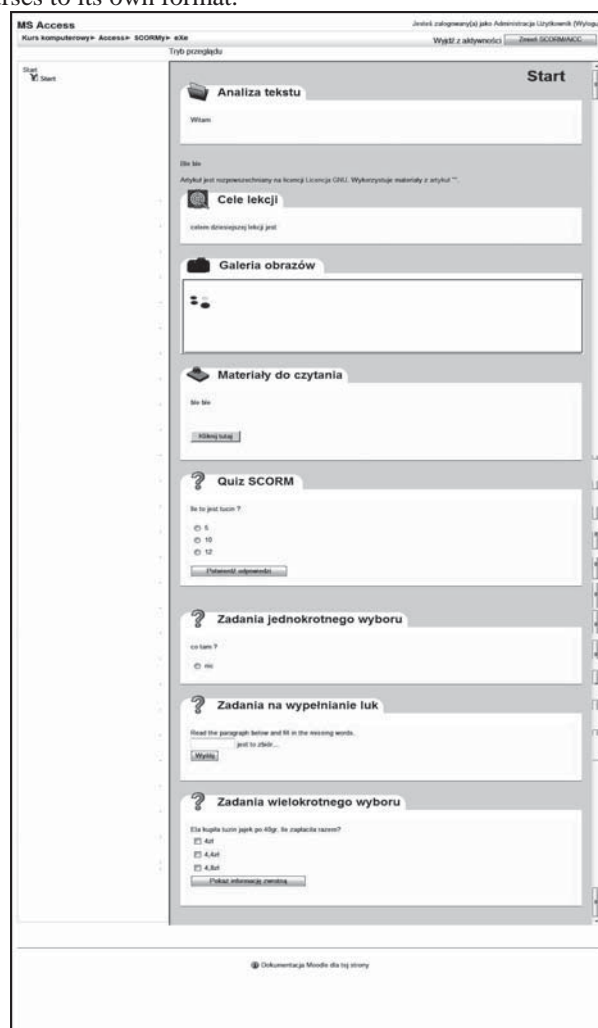


Fig. 7 Course form eXe moved into Moodle

## ACKNOWLEDGEMENTS

The authors are a scholarship holders of project entitled "Innovative education ..." supported by European Social Fund.

## REFERENCES

- [1] Moodle home page, <http://moodle.org/>
- [2] WBT home page, <http://pl.wbtexpress.com/wbte-moodle.html>
- [3] EXE home page, <http://exelearning.org/>
- [4] M. Dąbrowski, M. Zajęc, *Rozwój e-edukacji w ekonomicznym szkolnictwie wyższym*, Fundacja Promocji i Akredytacji Kierunków Ekonomicznych, Warszawa, April 2007
- [5] J. D. Łuszkiewicz, *Kształcenie na odległość – współczesne tendencje oświatowe*, Edukacja Ustawiczna Dorosłych, nr 4, 2003.
- [6] B. Sakowicz, P. Zalewski., M. Wójtowski, A. Napieralski "Elearning Standards and Department of Microelectronics and Computer Science Elearning Platform Description" 11th International Conference MIXDES 2004, Szczecin , Poland 24-26 June, pp. 654-657, ISBN 83-919289-7-7.