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APPLICATION OF TECHNOLOGY-ENHANCED LEARNING TOOLS
IN EUROPEAN HIGHER EDUCATION

VYUŽITÍ NÁSTROJŮ TECHNOLOGICKY VYSPĚLÉ VÝUKY
V EVROPSKÉM VYSOKÉM ŠKOLSTVÍ

Abstract

This paper aims to explore which tools of technology-enhanced learning are nowadays applied in the area of European higher education, to what specific functions and how intensively they are used, and what expenses are associated to them. The source of presented data are responses of exactly 100 universities (including VŠB – Technical University of Ostrava) from 27 European countries to a “Learning Tools Survey”, which has been created in Vienna University of Economics and Business Administration and which was distributed under the terms of the European Union’s Sixth Framework Programme project Intercultural Learning Campus (iCamp).

Abstrakt

Cílem tohoto článku je prozkoumat, jaké nástroje technologicky vyspělé výuky jsou v současné době aplikovány v oblasti evropského vysokého školství, k jakým konkrétním funkcím a jak intenzivně jsou využívány a jaké náklady jsou s nimi spojeny. Zdrojem prezentovaných dat jsou odpovědi přesně 100 univerzit (včetně VŠB – Technické univerzity Ostrava) z 27 evropských zemí na „Learning Tools Survey“, který byl vytvořen na Vinna University of Economics and Business Administration a který byl distribuován v rámci projektu 6. rámcového programu EU Intercultural Learning Campus (iCamp).

1 INTRODUCTION

The main idea of technology-enhanced learning is to support learning activities through information technology. This combination has a great impact on contemporary higher education institutions [2], [5], [7], [8]. However, it can be quite difficult to analyze how the rapid development of technology-enhanced learning influences the everyday life in universities, which tools and how effectively are used, and what costs are spent on it.

One of the initial partial tasks of the Information Society Technologies (IST) project Intercultural Learning Campus (iCamp) [1], running under the Sixth Framework Programme, was to investigate the state of the art in the field of technology-enhanced learning in European higher education area. Thus, many European universities were addressed with request for help by means of filling the questionnaire constructed chiefly by Fridolin Wild and Stefan Sobernig with the Institute for Information Systems and New Media, Vienna University of Economics and Business Administration. The iCamp partners, including Tomas Bata University in Zlín, have collected altogether 100 positive responses from 27 countries.

The principal aim of this paper is to briefly present and interpret the selected important results of the mentioned technology-enhanced learning survey.

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2 LEARNING TOOLS SURVEY

The survey related to the utilization of tools in technology-enhanced learning was firstly answered by 9 iCamp project partner organizations (the tenth one was absent from this due to the purely research status) [1] in the time from March until May 2006. Subsequently, the survey was disseminated among an array of European universities (from April to July 2006). However, not all respondents were willing to fill this quite complex on-line or printed questionnaire in English neither under a potential “motivation reward”. Finally, the responses of exactly 100 universities from 27 countries (including iCamp partners), which seems to be a very representative figure, have been gathered and evaluated.

The scope of the survey covers the use, impact and evolution of the learning tools [9], [10]. The “use” means primarily how are used the learning technologies to the intent of functionalities and interoperability. Then, the tool usage intensity and organizational embeddedness were comprised in the “impact” part. And “evolution” was focused on potentials of interoperability, portfolio and development and also on the financial and staffing resources.

3 RESPONDING ORGANIZATIONS

As it was mentioned above, the total number of collected responses is 100. Their distribution among all 27 represented countries can be seen in fig. 1. Then, the classifications of respondents from two different viewpoints are provided in fig. 2 and fig. 3. The bulk of organizations were public. Much fewer of them can be classified as private-non-for-profit and the others are of practically no consequence. Similarly, the majority of survey contributions came from organizations which belong to ISCED type 5A. Only about 20% classified themselves to ISCED 5B [6].



Fig. 1 Representation of countries

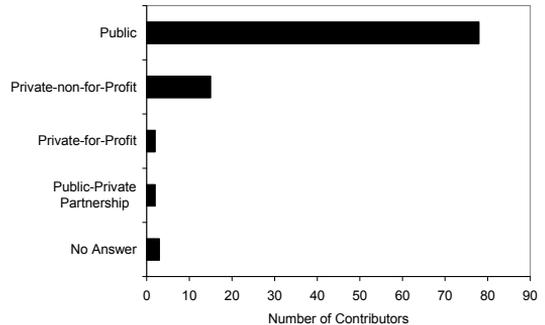


Fig. 2 Type of institutions (public vs. private)

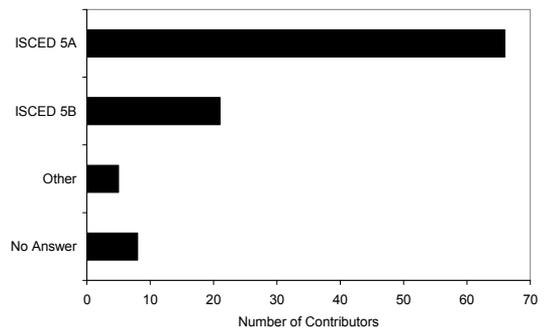


Fig. 3 Type of institutions (education classification)

4 PORTFOLIO CHARACTERISTICS

The institutions offer altogether 182 different tools (which occurred 290 times). The tool categories were represented by numbers shown in tab. 1.

Tab. 1 Tool categories

Tool	Number	Occurrence
Learning (Content) Management System	71	146
(Pure) Content Management System	15	20
(Pure) Administrative Information System / (Pure) Course Management System	18	19
(Pure) Course Management System	22	26
(Pure) Authoring Tool	14	18
(Pure) Learning Object Repositories	10	10
(Pure) Assessment Tool	32	51

As expected, the most significant and frequent items are learning (content) management systems (L(C)MS). It appeared 71 sorts of L(C)MS in 146 installations among all tools. An institution operates 1.6 L(C)MS, on average. Focusing more deeply on L(C)MS, the most common types and also concrete products of L(C)MS can be found in tabs. 2, 3 and 4.

Tab. 2 L(C)MS – types

Tool	Occurrence
Open-Source L(C)MS	47
Self-Developed L(C)MS	44
Commercial L(C)MS	42

Tab. 3 L(C)MS – Moodle

Tool	Occurrence
Moodle	44
Moodle + Other	29
Moodle + Commercial	15

Tab. 4 L(C)MS – products

Tool	Occurrence
WebCT	14
Blackboard	5
eDoceo	3
Discendum Optima	3
Eden	2
Fronter	2
Hyperwave	2
Ilias	2
Learning Cubes	2

There is quite balanced state among open-source, self-developed and commercial systems. The paper [4] has analyzed the experiences of 113 European experts, usually the systems managers in the institutions, in 17 countries, with the LMS that they have purchased or developed themselves. It has revealed 52 different commercial (with 134 instances) and 35 self-developed (35 instances) L(C)MS. Under assumption of slightly bigger sample size (113 vs. 100), the comparison of the situation several years ago with the contemporary state of the art, the distribution of commercial tools seems to be relatively constant. However, there is a great increase in self-developed tools.

The most widespread system is Moodle. It has on average 663.07 and a maximum of 3,600 active users in the cases where it is the only L(C)MS. When all 44 installations (including combinations with the other systems) are considered, the average number of users is 1,800.73 with a maximum of 28,500.

Looking closely on the five biggest systems (from the number of active users point of view), the following L(C)MS appear:

- WebCT (two instances)
- learn@WU/LRN
- CampusNet (self-developed)
- Blackboard
- eLSe (self-developed)

An intense discussion on the portfolio characteristics can be found in [9], [10].

5 FUNCTIONALITIES

The analysis of supported functionalities has brought the results from fig. 4. The dominant types of activity are text-based communication and assessments. They are used in almost every system. Still more than half of the respondents reported the use of quality assurance and evaluation and collaborative publishing. An array of other activities, such as individual publishing, social networking, authoring learning designs or audio/video-conferencing are still supported, but more rarely. The most unusual are tools for user portfolio management and simulations + online labs. Altogether, the multimedia-oriented activities are much less supported than the classical, mainly text-oriented, ones.

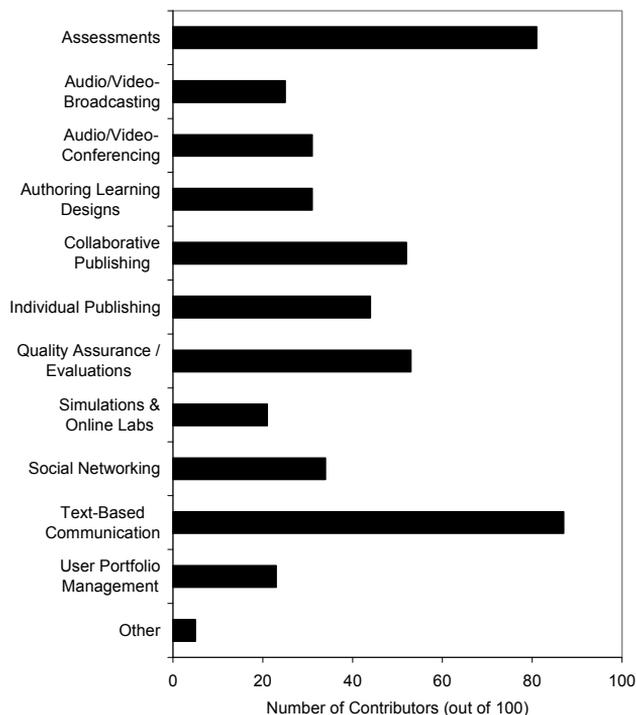


Fig. 4 Supported activity types

6 RESPONSIBILITY AND FINANCING

In most cases, a specialized e-learning unit is responsible for technology-enhanced learning. However, considerable degree of responsibility lies also on other groups, such as computer centers, faculties or departments, institutes or chairs, or the rectorates itself – see fig. 5.

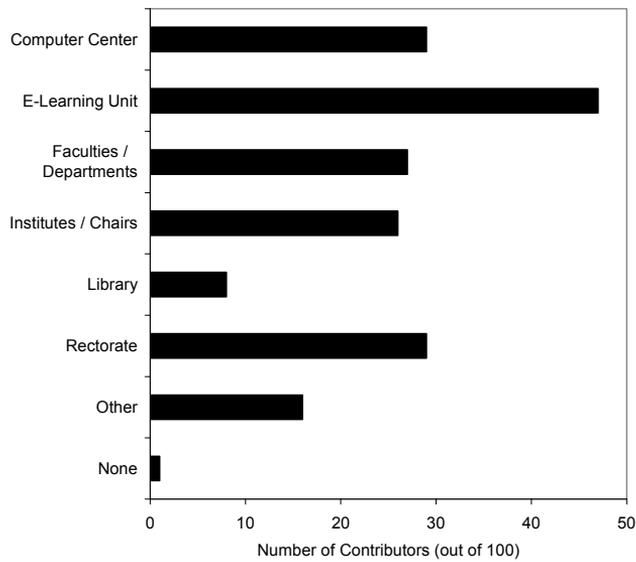


Fig. 5 Responsible unit

Regarding the budget which is at organizations' disposal for technology-enhanced learning purposes, the most contributors are able to spend only less than 10,000 EUR per year. On the other hand, many universities of bigger size devote to these activities more than 500,000 EUR yearly. The most common source of finances is a regular budget, research grants or public (non-research) funding. The detailed overview of the budgets and their sources are shown in fig. 6 and fig. 7, respectively.

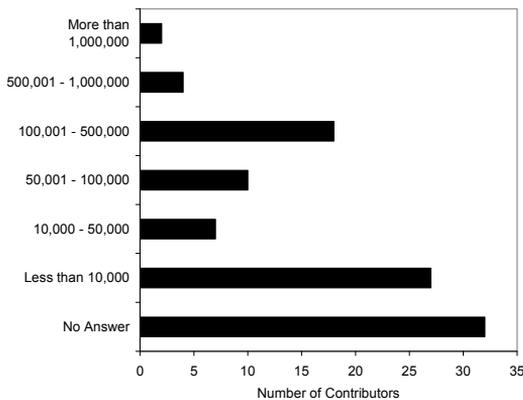


Fig. 6 Yearly budget (in EUR)

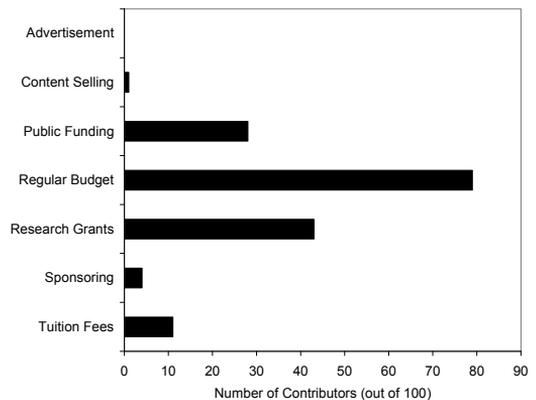


Fig. 7 Financial sources

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7 CONCLUSIONS

This article has been focused on the short overview of the state of the art in the field of technology-enhanced learning in European higher education while the presented information are based on responses of universities to the “Learning Tools Survey”. Looking only at L(C)MS, the most popular system is Moodle. All in all, synchronous, multimedia communication and collaboration tools suffer from the lack of organizational support and rather traditional technology-enhanced learning functionalities are nowadays used within institutions. Besides, more inter-organizational cooperation as well as more interoperability considering learning services and learning repositories would be useful. The perspective scenario of today world seems as the university with its own powerful educational platform, however also with intense connection to the open-source environment.

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