

iCamp: The Educational Web for Higher Education in an Enlarged Europe

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Abstract: European higher education has started to successfully implement technology enhanced learning strategies. The level of uptake varies however substantially between institutions and countries. Regarding the technical solutions, a similarly heterogeneous picture can be drawn. Whereas the variety of commercially licensed and open source systems currently in use responds to different needs of the users, this technical diversity faces the drawback of restricted data exchange possibilities across systems. A recently started initiative called “iCamp” is challenging this situation by suggesting a networked learning environment for collaboration and networking across technical, institutional, and national borders. The aim of this new project is to connect different learning systems, services and content repositories via interoperable interfaces. From a pedagogical perspective the project is focusing on scaffolding self-directed learning, collaboration and social networking across national borders.

1. Introduction

The Lisbon strategy and its corresponding action plan for 2010 to establish a single European information space - i2010 - forms a common basis for reforms needed in an enlarged Europe [1]. One of the areas where a common information space is essential is in higher education. A multidisciplinary research team of partners from old and new member states has recently started to realise the vision of establishing a common educational web for higher education in an enlarged Europe. The initiative is called “iCamp – innovative, inclusive, interactive & intercultural learning campus” [2] and is co-financed by the European Union under the IST programme of the 6th Framework Programme [3] for the duration of three years.

One of the driving forces for this project, which is currently work in progress, is the heterogeneity of the technological landscape that currently prevails in Europe’s higher education. There are numerous advantages that a diversity of eLearning offers holds in store, especially for the users. Instead of urging all users to adapt to the same system, a variety of technical solutions allows a more individualised approach and responds better to the different requirements of each individual and the organisational context. However, the disadvantage that we are currently facing is the fact that the different systems are not compatible and often they do not allow data exchange. This hinders collaboration across systems. Thus, one of the technical challenges for a common information space in higher education is to find ways for system interoperability. This is a main issue for iCamp.

In addition to the more traditional learning management systems recent developments related to so called “social software” and “eLearning 2.0” [4] further enrich the heterogeneous landscapes. With technologies such as weblogs, wikis, RSS, etc. the

production of content has become more dynamic and the individual participant has been given greater freedom in active participation and collaboration. Social software tools are thus going to be important elements in the learning environments of iCamp.

In this paper we would like to point out some of the main objectives of the iCamp project, highlight the technical approach that the project pursues towards system interoperability and argue on how it contributes to the goals set in the Lisbon agenda for 2010.

2. Objectives

The main objective of iCamp is to create open virtual learning environments for higher education across Europe by connecting different learning systems and tools with a special focus on open source software. We envision this networked learning environment as a learner centred environments where participants will find scaffolds for self-directed learning, collaboration and social networking across national borders and disciplines.

Driven by the heterogeneous landscape of systems, services and content repositories for technology-mediated higher education the main idea behind the technical concept of iCamp is on providing interfaces for interoperability. Instead of developing yet another learning platform the iCamp idea is that of a networked environment which leaves room for system heterogeneity, organisational and individual preferences. The content for this collaboration is enriched via distributed networked repositories including content brokerage platforms, online libraries, learning object databases, etc. Here, the Simple Query Interface (SQI), a standard developed jointly by a group of European researchers [5] will serve as the basis for further development and improvements with regard to system interoperability.

Since iCamp is not creating an additional eLearning system, but facilitates interoperability, a main advantage is that institutions as well as individuals can continue to use and further develop their preferred systems and tools, while at the same time connect to and collaborate with others. Users will be more flexible in choosing their own preferred tools and will be able to connect to heterogeneous landscapes.

The project also puts a strong focus on the integration of social software, such as wikis, weblogs or social networking services. Although not originally developed for educational purposes, these solutions have started to conquer users in a bottom-up approach and are to a growing extent used for knowledge sharing, collaboration and networking. Bringing it down to two main characteristics it can be emphasised that social software a) facilitates the construction of relationships amongst individuals and groups and b) supports the active role of the user as a producer of content [6], which qualifies social software as important tools in the iCamp setting.

From a pedagogical perspective iCamp pursues the idea of scaffolding self-organisation, collaboration and social networking. The development, advancement and application of these competencies need to be well supported by the technical infrastructure that we envision. The pedagogical concept of iCamp stresses an active participation of learners in the knowledge creation and knowledge sharing process and supports the advancement of key competencies – self-organisation, collaboration, establishing social capital - for life long learners. These are core competencies that enable citizens to face the challenges of an inclusive information society.

3. Methodology

3.1 Research approach

The research approach in iCamp is characterised by an iterative interaction process between theoretical design work, technical developments and validation trials in naturalistic

contexts. In the early 1990s a group of educational scientists trying to better account for the educational context when drafting new theories and tools [7] created the rather young methodological approach of design-based research. Following their tradition, iCamp foresees three trial phases during the project. A crucial element in the design process is a close dialogue between researchers and practitioners [8]. The empirical work will rely on the pedagogical design concept supported by the technical infrastructure. The facts that the envisioned learning experience will be across national borders and that the interaction will be virtually mediated are important contextual constraints (e.g. with regard to language).

In order to get a clearer picture of the current situation regarding technological infrastructure in European higher education a survey has been launched which tends to identify the most commonly used systems, commercially as well as open source. Respondents are also being asked about the future eLearning strategies of their institutions, the identified limitations of the currently used systems and existing interoperability challenges. The survey results will be complemented with desktop research on recent system developments, emerging tools and services.

In addition, we will continue the successful work started in previous projects of connecting systems via SQI. iCamp is integrating and connecting a broad range of additional content sources such as digital libraries and social software tools.

3.2 iCamp's approach towards EC policies

As identified in the i2010 challenges *there are huge market opportunities in the development of attractive content and services [...]. Yet, progress in this area is slow. [...] it is important for the European Union to [...] (foster) the emergence of innovation services [1].* iCamp offers new opportunities here by providing access to distributed repositories including online libraries. The service itself provided by iCamp helps to identify and access the specific content for cross-cultural learning experiences. It further explores ways to retrieve important information from the deep web by extending the SQI and thus providing interoperability amongst the various systems.

The Bologna Process [9] defines another important guiding policy for iCamp. The aim of this process is to harmonise the architecture and establish the European Higher Education Area (EHEA). The interactive and integrative approach of iCamp fosters inter-institutional co-operations amongst educators and students. By involving students and educators across countries, a more balanced and objective opinion on the achievements by the students as well as on the performance of the educators can be reached.

iCamp also contributes to more student mobility across Europe as it offers the possibility to follow a course independent of the location. The creation of social networks amongst students from different countries should help especially students from the new member states to connect with their peers across Europe. According to the EC benchmarking study on the 2010 objectives for education and training the mobility of students is still below the expectations of policy makers [10]. In the acceding countries the share of foreign students is with 1.4% currently very low. Regarding the share of students enrolled abroad there are great differences among acceding countries. In Cyprus more than 60% of tertiary level students study abroad. This compares to below 2% in Poland. iCamp sees itself as an important means to trigger more mobility and to enrich different national cultures.

Finally, the cooperation and collaboration of students from different countries also implies social challenges that are related to cross-cultural aspects and diversity. Whereas the exchange programmes and study visits across Europe are already a very common means for students to get in contact with other cultures, a virtual collaboration such as proposed by iCamp is still a challenge for diversity management.

4. Technology Description

The technical approach of iCamp is concentrated around three broad topics: interoperability, socio-constructivist learning tools and open source. The virtual learning environment of iCamp builds on existing interfaces and integrates shared community features. With the developments of the last few years, the eLearning market has been (over)populated with tools and platforms to support different types of learning communities with learning management, content management and communication tools. Open source tools are gaining reputation and have had a high uptake in eLearning. As mentioned above, we are currently collecting empirical data on the use of eLearning tools and services in European higher education institutes to identify the most important tendencies.

Nevertheless, there is still a lack of interoperability between the various systems. Standardisation work tries to overcome sub problems, but has only done so to a minor extent. In iCamp, we build upon our experiences with the Simple Query Interface (SQI) that provides means to interconnect and integrate learning object repositories.

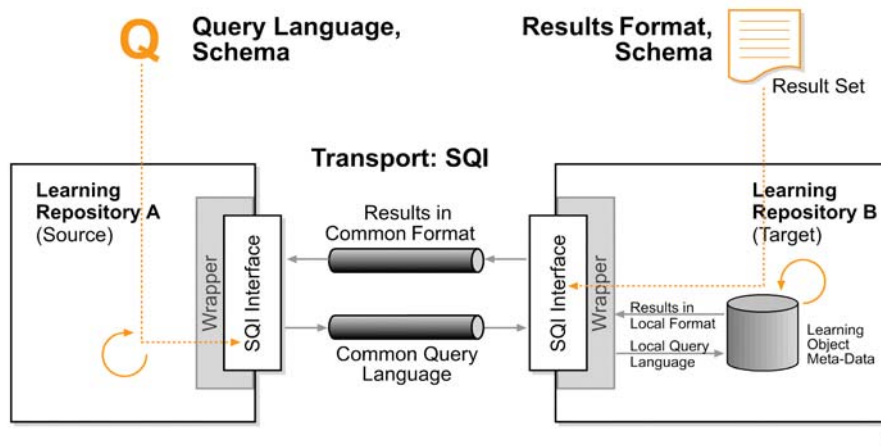


Figure 1: Communication between Source and Target Repository via SQI (cf. [10]).

SQI is an interoperability infrastructure that enables heterogeneous systems to communicate with each other for the purpose of distributed learning object retrieval. Typically, this communication is based on web services (using SOAP messaging via HTTP as a network protocol). To be put into practice in, e.g., a joint network of learning object repositories, SQI relies furthermore on a common schema, defining common semantics, and a common data model as well as a format, specifying which common query language is to be used and how results should be encoded and represented. Communication can take place synchronously or asynchronously (cf. [11]).

Through this abstraction of the data exchange process between different learning systems and tools, a variety of application scenarios are enabled. At present the most prominent examples are networked learning object repositories (both stand-alone and integrated applications). Within iCamp, for example, the EducaNext repository (cf. [12], [13]) has been provided with an SQI interface that enables other repositories, e.g., Ariadne (cf. [14]) to find learning objects that fit their users' queries within the other systems. This distributed network search as shown in Figure 2 can currently be accessed via www.educanext.org.

Figure 2: Network Search Interface in Educanext

So far, development has focused on querying for distributed learning resources. The challenge for iCamp is to allow cross-collaboration of students amongst these various eLearning systems, including social software applications, and to facilitate the joint use of community features. The iCamp development team is e.g. working on an SQI interface for one of the most popular open source eLearning systems currently in use, namely Moodle [15].

5. Expected results

As previously mentioned, this paper is presenting work in progress and cannot rely on any final outcomes. However there are already some intermediate results that are worth highlighting and that indicate the potential of iCamp.

An initial task has been to identify the current trends regarding technical solutions for eLearning in Europe's higher education and to gather some empirical data, especially from the new member states. Although not yet completed some interim results from the eLearning survey already confirm the trend towards open source systems and the popularity of Moodle. Not surprisingly interoperability across organisations is still very low. The complete study results will be available in autumn on the iCamp website [2].

As iCamp envisions a more active cross-national and cross-organisational collaboration, it has to overcome the constraints of system borders. The work on system interoperability will result in interoperability guidelines including an interoperability check as well as open source software modules.

Another main outcome will be the iCamp building blocks - open source software modules - that can be arranged according to needs and preferences. The iCamp building blocks can be integrated on a large scale in universities or they can be provided for individual users that will then be able to arrange their personal learning environments with iCamp-approved tools that guarantee interoperability with others.

6. Conclusions

Although not yet verified through the upcoming validation trials, the presented paper offers a general hypothesis on how iCamp may contribute to establishing the European information space for higher education where cross-cultural learning experiences can take place. This entails technical, pedagogical and social science aspects and requires an interdisciplinary research approach. While the results of the empirical work are expected to

inform specifically the further design process within the project and contribute to the improvement of the pedagogical models and technical tools, the overall project is expected to inspire further developments within all contributing disciplines.

Recent experiences with the implementation of the SQI have already shown some first success and have raised great interest all over the globe. We envision contributing to an even wider uptake of this standard by our further developmental work, especially with the strong focus on reaching interoperability at collaboration level. A close collaboration with partners from the PROLEARN network of excellence [16] will further add to advancements in this respect.

Regarding the pedagogical work in iCamp we expect to contribute to the use of ICT for higher education by suggesting some innovative pedagogical models that do reflect the changes that we are undergoing during our transformation towards an information society. These changes include technological progress as well as societal and economic developments.

Overall, with the iCamp initiative we are expecting to contribute to the i2010 objectives and support the realisation of the inclusive information society in an enlarged Europe. The project will just be a very small piece in this mosaic, but it has its potential for contributing to paving part of the way. The question of how the results might be implemented and what this implies in terms of rethinking and some eventually drastic systemic changes in higher education remains to be an open issue and shall lead to further discussions amongst researchers, educators and policy makers.

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