Evaluation of the UNIVERSAL Exchange for Pan-European Higher Education project

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ABSTRACT
The UNIVERSAL Exchange for Pan-European Higher Education project is a project that aims at demonstrating the feasibility of an open exchange system for learning resources between institutions of higher education across Europe and elsewhere in the world. A service has been established for the exchange of learning resources, called EducaNext (http://www.educanext.org/), which builds on a LRBS called the Universal Brokerage Platform (UBP). The UBP provides services for covering critical issues such as the announcement, offering, distribution, and exchange of learning resources. In Universal, the UBP acts as an educational broker. The purpose of this paper is to present the evaluation of this project that was conducted with major goal on how to improve the services offered to stakeholders.

KEYWORDS: *Brokerage systems, usability evaluation, online education, e-learning*

INTRODUCTION

 The Web puts a huge number of learning resources within reach of anyone with Internet access. In most cases, these valuable resources are difficult for most educational stakeholders to locate efficiently and effectively. This is why e-Learning Resources Brokerage Systems (LRBS) have emerged. In very generic terms, an online "brokerage system" is an on-line entity that acts as an electronic marketplace. A brokerage system has two types of users: those who offer their products for use and/or sale (providers) and those who use and/or buy the products offered (consumers). An e-learning objects brokerage system facilitates the exchange of learning objects among organizations and individuals.

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resources. In Universal, the UBP acts as an educational broker. Like an electronic market place the platform provides facilities for the purpose of exchanging learning resources among individuals and organizations. The purpose of UBP is not simply to host and deliver learning resources, but to reuse and share them either in a commercial or in a community-like setting. The UBP offers the user functionalities such as to browse and search in a catalogue of resources, manage an e-portfolio of favourite resources, book resources, annotate resources, and contribute resources.

There are 116 institutions that currently participate in this project. There are a total of 1023 registered users and 334 active users (who logged in at least once). Furthermore, there are 304 available resources from which 26 are Educational Activities and 278 Educational Material and as of April 2003, 951 bookings of LR took place. This paper is the outcome of a work-package that focuses on the evaluation of the UBP within the context of use. Findings from usability evaluations conducted by others (Retalis, 2003) will be intertwined with the findings from this evaluation to help illustrate the various aspects of the project and what needs to be done to improve it.

EVALUATION METHODOLOGY

While several approaches, models, and stakeholders were taken into account, the focus of this evaluation was to collect data to help improve the UBP. The evaluators worked closely with the project's team to design the evaluation, so that it meets the objectives of the project and furnishes findings that will be used to improve UBP. After conducting a literature review of research and evaluation studies conducted in the field of usability evaluation and evaluation of educational technology projects, and after negotiating the goals and purposes of the evaluation with all the stakeholders and the design team, the UBP evaluation plan was implemented as described below.

The selection of evaluation method and procedures depends on several factors such as the nature of the system to be evaluated, the questions of the evaluation, stakeholder needs, and the evaluation timeframe. The plan was shared via email with the rest of the team so that their input and interests was accounted for in planning the evaluation. This helped establish a shared vision, ownership, and leadership on the project and allowed for multiple voices to be heard. As part of the project, an evaluation has been conducted to provide information on how to improve this project. The major goals for this evaluation were:

- Enhance UBP's functionality and robustness thus increasing its breadth and effectiveness
- Create requirements patterns for e-learning course brokers
- Make recommendations about the appropriateness and usefulness of the Universal service as an e-learning course broker

The evaluation method was based on a combination of simple quantitative approaches (descriptive statistics) and qualitative techniques (analysis of documents, data collected from open ended questions, interviews, observations, usability testing, and memos).

The evaluation process comprised of three highly interrelated parts:
1. Comparison of UBP with a number of similar brokerage platforms.
2. UBP usability evaluation and defect analysis.
3. Evaluation of EducaNext service within the context of use.

Evaluation findings from this report can be used to help understand and improve the service provided by UBP and will have implications for other brokerage systems used in education and training. This paper will focus on the evaluation of service offered by UBP within the context use

(3rd part of the evaluation) and while discussing this part of the evaluation, connections will be made to data and findings from the other parts of the evaluation that focused on identifying brokerage patters and defect analysis (Retalis, 2003).

Evaluation of EducaNext service within the context of use

The major evaluation goal was to provide information on how to improve the service provided by UBP. A clear understanding of the project's goals is essential to the evaluation process. The specific goals and questions set for this part of the evaluation of EducaNext service are listed below:

- How can the overall quality of service provided by UBP be improved?
- To what degree can provisions of training material be improved?
- How can placement of LR in the system be improved?
- Are the descriptions of offered LR sufficient? How can they be improved?
- How can the locating (search, browsing, etc.) of a LR and booking it be improved?
- How can the delivery of LR to the consumer be improved?

Activities and Data Collection

For the purpose of this project the service component of UBP was evaluated using data from a variety of sources (prior evaluation sections, questionnaires, usage statistics, review of the site, follow up interviews). These sources are briefly described below. A detailed literature review was also conducted to examine the overall effects of brokerage systems and the issues behind the quality of service they provide, problems and concerns among stakeholders, and prospects for further development.

In order to develop the service evaluation questionnaire, the following were taken into consideration:

- Prospective users profile
- Evaluation goals as they were negotiated and agreed upon among the evaluation team.
- Review of other usability instruments (CSUQ, NAU, NHE, PHUE, PUEU, PUTQ, QUIS, SUMI, WAMMI) and approaches (Jeffrey, 1994; Jeffries, Miller, Wharton, & Uyeda, 1991; Nielsen, 1993; Norman, 1993, 1999; Shneiderman, 1998).
- Other educational technology evaluation studies, models, and approaches (Heinecke & Willis, 2001; Herman et al., 1987; Stecher & Davis, 1987; Stufflebean et al., 2000).
- Real users' input.

The questionnaire consisted of 22 closed questions and 5 open questions, which allowed participants to provide their input on aspects of the project that cannot be easily represented with closed questions. The questionnaire consisted of 2 parts:

- Part I—Background information on users and experience with ICT and EducaNext
- Part II—Quality of Service
    1. Overall quality of service provided by EducaNext
    2. Provision of Learning Resources (LR)
    3. Placement of LR in the system.
    4. Descriptions of LR offered.
    5. Locating and Booking (search, browsing, etc.) a LR.
    6. Delivery of LR to the consumer

    7.   Open-ended questions.

Question items were designed to collect data to address the above issues. Once the instrument was developed, it went through 2 rounds of revisions. First, during the expert review phase, the instrument was shared with 5 experts in usability evaluation and educational technology evaluation in order to receive their feedback. Once revisions were incorporated from the expert review the instrument was pilot tested with 10 prospective users. Following the pilot-testing, 10 questionnaires were completed from 2 institutions in different countries. After administering the questionnaires we continued with a follow up interview with the users during which we kept notes and asked questions for clarification and elaboration on the concerns and problems facing the project. These interviews provided rich qualitative data on several aspects of the project. In addition, document from minutes of meetings among the various stakeholders and production notes were all gathered and reviewed for the purpose of this evaluation.

Date Analysis

For data analysis, we followed two stages: the inductive and deductive. Upon entering the inductive stage, we organized all data and memos. We used data displays, concept maps, and tables to illustrate findings of the evaluation. We calculated descriptive statistics based on the survey data collected from real users. Verbal comments and responses to the questionnaire's open-ended items were organized and tabulated according to the issue they address. Once all data were collected and organized, the evaluators read carefully through it and tried to identify major assertions. Once we generated assertions from the data as a whole, we entered the deductive stage. In this stage we engaged in detailed examination of the data corpus and looked for data to confirm or disconfirm our assertions. The findings of the report were shared with other stakeholders in order to check for its plausibility.

MAJOR FINDINGS

When examining the functionality and the services offered by the brokers, one can create a superset of these features and form the ideal functionality. This superset summarized below can be considered as the requirements specifications for an "ideal" e-learning objects brokerage system. Retalis (2003) argued that the major tasks that LRBS perform are:

1. Browse catalogue of resources
2. Search resources
3. View resource details
4. Reserve details
5. Manage reserved resource
6. Buy resource (payment)
7. Resource delivery
8. Contribute resource
9. Manage contributed resources
10. Annotate resource
11. Personal user account
12. Update notification
13. System informative material
14. Company informative material
15. Contact system personnel
16. Multilanguage support
17. Specialized features

Some of the major findings from this evaluation were the following:

- Resource browsing and searching is adequately supported by UBP. The only possible improvement is the provision of some kind of sorting of the returned results, based on their relevance or user ranking.
- Viewing the details of a resource can be further improved by presenting user comments, reviews and ratings, which are sometimes the only criteria as to the appropriateness of a resource prior to its delivery.
- In managing the reserved resources, the viewing of reserved resources is not adequate and can be extended into viewing all past reservations and allowing for user comments, rating and categorization.
- Since a personal account is required for the system's users, a "personalization of the site" feature should be available (e.g. the information on the home page).
- Although a content update notification is somewhat implemented on the system's home page, a user should also be able to receive update notifications via email, personalized according to each user's preferences.
- A site map would be a helpful addition to the system. Also due to the large number of technical terms, many users might also appreciate a glossary.
- Information regarding the organizations that support the system might appear in a more discrete way, perhaps through a link not in the main menu. This will help the users to focus on the system's functionality.
- The user is able to contact the system's personnel via email or a feedback form. This could be extended to include a support request form, which would allow a more structured way to submit one's questions.
- A discussion forum might also be considered as a feature to be implemented at some later version of the system, if this proves to be helpful to the system's users.
- The distinction between a Learning Resource (LR) and a Learning Activity (LA) is not clear or understandable.
- All users but one mentioned that they were keen on returning to UBP and utilize it after the end of the evaluation experiment.

CONCLUSIONS AND RECOMMENDATIONS

The services offered by EducaNext are of great value to the education community. If we accept the fact that teachers are usually overwhelmed with work and that they do not have sufficient time to constantly prepare material, then why not use quality material already developed and available online. Based on these assumptions, EducaNext can continue to make a serious contribution. However, certain measures need to be taken and the issues identified in this report need to be addressed. Based on the data analysis and the findings of this evaluation, the following recommendations can be made regarding the quality of services offered by EducaNext.

- Develop strategies that will improve the variety of disciplines covered by LRs available via EducaNext and increase the diversity of material offered. This can be achieved by better marketing the services offered and informing the education and training communities about the project, disseminating the research behind the project to national and international forums, and soliciting LR from experts in the various disciplines. The lack of participation might relate to the lack of ICT skills often cited in the literature. When educators do not posses adequate skills to participate in this project, they will not make use of EducaNext nor post any LRs. Therefore, this is another additional reason for which extra care should be taken to ensure that the portal is usable and transparent. A self-paced tutorial on how to use the system can be a good resource.

- Make better use of metadata so that resources are easily searched, re-used, modified and adapted. LRs can be divided into 2 categories: those that can be adapted and modified and those that cannot. So, users can know ahead of time the degree of flexibility they will get. Furthermore, guidelines should be established to guide EducaNext users on how to better prepare their LRs before posting, to ensure re-usability. The efficacy of metadata use and the descriptions provided by users need to be addressed to ensure better indexing of LRs. Moreover, the meta-data description takes too long since a lot of elements should be filled in. There is a need for templates and automations in the meta data description when uploading a learning resource (e.g. automatic recognition of formats, of file size, provider, etc.)
- Quality assurance is a major issue. From the data collected from this evaluation, it is clear that the quality assurance mechanism is non-existent. There needs to be a better procedure established that will ensure that the quality of LRs posted and distributed via EducaNext are of high quality. Failure to do so, will result in the diminishing of the use of the services by users. A peer review process similar to that of MERLOT can be effective in helping establishing high quality standards for LRs (as suggested by one of the participants in this evaluation). Furthermore, a special committee with content experts can be established that will be reviewing LRs submitted and rating them according to their quality, following a pre-established set of criteria. Such criteria can be the following:
    - Appropriateness of the content for the level it is proposed. The language used, graphics, and other media attributes as they apply to the proposed context of use.
    - Accuracy of the data and information presented for the specific subject it covers. The information should be relevant to the subject, the level, and proposed context of use.
    - The organization of the material presented and its clarity. Are the objectives, methods, procedures, and evaluation clearly defined?
    - The degree to which material provide a comprehensive coverage of the issue addressed in the LR.
- There is a need to build a critical mass of users and certain plans can be established to promote the use of services within partner institutions which can ensure a larger usage of the project.
- A better way of describing LRs is important that will allow users to easily find what they want. Descriptive titles and key words might not be sufficient. It might be good to include the titles always in at least 2 languages: 1 the language in which material is developed, and in English.
- Once a user clicks on a LR to get more information, there should be a list of additional resources posted either by the same user, from the same institution, or of similar content. This will allow users to faster locate LRs that are of interest to them and better serve their needs.
- Issues of copyright, intellectual property, and accreditation need to be better addressed.
- Market the unique features of EducaNext as it compares with others. At technological level, EducaNext platform (i.e. UBP) is the most complete system concerning the functionality than any of its competitors.

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