BSCW as a support system for distance teacher training

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This paper presents the experience of using a particular web based groupware tool, Basic Support for Co-operative Work (BSCW), in the frame of a Socrates Comenius 2.1 European Project devoted to produce and spread a WebQuest online course to train teachers taking advantage of using the web in the classroom. The paper reports some of the issues encountered in implementing BSCW, reflects the student reactions to this system and concludes about the convenience of using it in distance teacher collaboration and training.

Keywords Computer Supported Collaborative Working; Distance Learning; Teacher Training; Socrates Project; Comenius 2.1

1. Introduction

CFIE Valladolid II and Valahia University Targoviste are participant institutions in the Socrates Comenius 2.1 European project called "Think, Construct and Communicate. ICT as a virtual learning environment" -http://cfievalladolid2.net/thinkweb-, being the first one the designer and coordinating institution. The main purpose of this three-year project, starting in 2002, is to promote the cooperation between different European teaching and educational institutions to produce and disseminate a WebQuest [1] based online course to train teachers and future teachers with the objective of stimulating a didactic use of the World Wide Web.

Eight institutions from five countries are involved in the project: Joensuu University (Finland), Torino CIDISS (Italy), Bielsko-Biala RODN "WOM" Teacher Training Centre (Poland), Cluj-Napoca Babes-Bolyai University and Valahia Universitiy Targoviste (Romania), and Gijón CPR, CFIE Valladolid II and Zaragoza CPR 1 Teacher Training Centres (Spain). These institutions cover the following educational levels: Infant, Secondary and High School, University Education and Teacher Training. The geographic separation among them has required the exploitation of a web based groupware platform to develop the different project tasks and to accomplish the project objectives in an efficient way: daily cooperation in project management, online course designing and improvement, translating and adapting it to national peculiarities, running the different national online versions in several editions, evaluating the results, disseminating the goals of the project, etc.

BSCW, Basic Support for Cooperative Work [2, 3], is a WWW based groupware application that supplies a system of "shared workspaces" where a group of distant collaborators can share information with the only aid of a standard web browser. Shared workspaces provide file upload and download, document revision and rating, event notification, threaded discussions, personal and group agenda, user authentication, user and group management, user roles definition, etc. This system, previously described as a tool to support collaboration in educational projects [4-6], was selected in the first stage of the project by the participant institutions to achieve their objectives and, particularly, to develop the WebQuest distance teacher training.

2. Materials and Methods

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2.1   Reasons to use BSCW

In the last years, several suitable e-learning and groupware environments [7, 8] have been available for the Internet. Why BSCW was selected by the project institutions as a platform to develop the online teacher training and the project coordination tasks? BSCW does not provide some of the specific facilities of a Managed Learning Environment being used in a distance education or training context, like easy authoring and assessment tools, classroom management, production of documentation and statistics on the course in the format required for institutional administration and quality control, etc.

BSCW can, however, manage in a natural way the main information objects created with standard word processors or other office software used for authoring, all of them easily capable of being hyperlinked together in a appropriate structure of teaching materials. It provides a multilingual interface, a useful system of document revision and rating, personal and group agendas, differential access rights for instructors and students, integrates searches on the web, electronic communication support including e-mail, discussions and chatting, etc. Nevertheless, the core of BSCW is the "shared workspace", essentially a folder that a group of users can share to collaborate in a wide sense, which incorporates an event management mechanism that keeps a user informed about the recent actions from the rest of collaborators in the workspace. These facilities can promote not only cooperation between instructor and learner so that the expert provides coaching and scaffolding, but cooperation between students allowing the free exchange of ideas and outcomes. These points directly connect with the WebQuest methodology that encourages the cooperation between learners. Furthermore, at the end of the online course, BSCW allows to maintain the collaboration between instructors and learners, without a severe change in the methods, in order that teachers implement the WebQuest methodology in their classrooms.

Since there is some free BSCW server [2] in the WWW, one of the aims of the project institutions was not only to take advantage of BSCW system during the runs of the online course, but to make it known to the teachers in order that they can exploit it in the future with their own students and collaborating among their own educational centres.

2.2   Implementing BSCW

The BSCW software is free for educational purposes, can be installed locally under UNIX or Windows systems with relative ease, and gives prompter responses and complete local control. The project decided to install and manage its own local BSCW server at http://cfievalladolid2.net/bscw, despite the fact that the use of a existing free BSCW server would have implied a significant saving of resources and effort. The reasons for this choice were mainly three. Firstly, the user quota in the free server had a limit of 10 MB. On the other hand, some BSCW functions like the JMonitor console (a synchronous tool that allows chatting and real time event notification) were not enabled in the free server. Finally, BSCW can maintain an historical record of every event that takes place in the system. All requests to BSCW are logged in a plain text file containing the fields: request date and time, remote host, username, request method, BSCW operation, response code, request CPU time, request real time and request path. Therefore, although BSCW does not provide an integrated reporting tool that automatically determines the meaningful statistic data, the information from this file in a local server can be straightforwardly imported and analyzed from a database manager application. In this project, MS Access and MS Visual Basic have been used to determine relevant statistic information from the point of view of both the project and the online course, like user access by date and time, usage of different platform functions, etc.

A local BSCW 4.1.4 system has been installed on a 2.4 GHz Pentium 4 CPU machine with 1 GB RAM using MS Windows 2000 server, with a 3-year licence for 300 users. A 512/4000 Kbps ADSL line supported the user connections to the system. This bandwidth has shown itself as reasonable since the maximum number of simultaneous user hits during the online course has been nearly 10. Managing a local BSCW server has also allowed to detect some inefficient usages of the environment, and then correct and optimize some user processes. In addition, it has made possible that the project institutions gain some valuable experience about groupware.

2.3   Implementing the distance training

The WebQuest training has been designed as a 30 hours online course facilitated by tutors, beginning with a brief face-to-face introduction session. An English version of the course has been designed as departure point to translate and adapt it to the national language and peculiarities of each country. A combination of one-alone and many-to-many teaching methods [7] has been used during the course.

Each tutor has set-up a BSCW shared workspace with the course materials and has sent an electronic invitation to his/her pupils group in order to register in BSCW and share this area. This workspace has held the course syllabus, agenda, HTML and PDF content documents, threaded discussions, task and outcome folders, and support and evaluation documents. The initial course units have been devoted to a concise introduction on BSCW functions and the rest to the WebQuest methodology, being the step-by-step design of an original WebQuest activity the main course outcome. Asynchronous BSCW communication tools have been essentially used (without chatting, although videoconferencing has been used in a subsequent phase, to share course results among all institutions). Each learner has been able to share new private o public workspaces to collaborate with others. Tutors from each institution/country have shared another workspace to coordinate the tracking of the course.

3. Results and discussion

Two course runs have been done with a total of 323 participants, of which 185 learners have reached the established course objectives. Results in this section refer to these last ones except 11 students from Joensuu who have used the e-learning platform established by their University. Results have been obtained from analysis of the BSCW log files as well as from student feedback by means of questionnaires containing both open and multiple-choice questions that dealt with subjects like functionality, satisfaction, impressions, etc. For nearly all of them this course has meant the first contact with BSCW.

3.1   Usage of BSCW

Fig. 1 presents the statistics of BSCW usage during the online course. Fig. 1.a) shows three different styles of daily usage. In the case of Spanish Teacher Training Centres, there is an important number of requests in the morning, from the learner working centres. However, the most important request amount corresponds to the evening, from the learner home. For Torino CIDISS the most numerous access correspond to the afternoon, from the learner working centre (a more suitable time for Primary teachers -the great majority of learners corresponding to this centre-, while in Spanish institutions Secondary and High School teachers predominate). For Cluj-Napoca University there is an access peak about 18:00 and nearly no access after work. In addition, Fig. 1.b) shows that for this institution the most
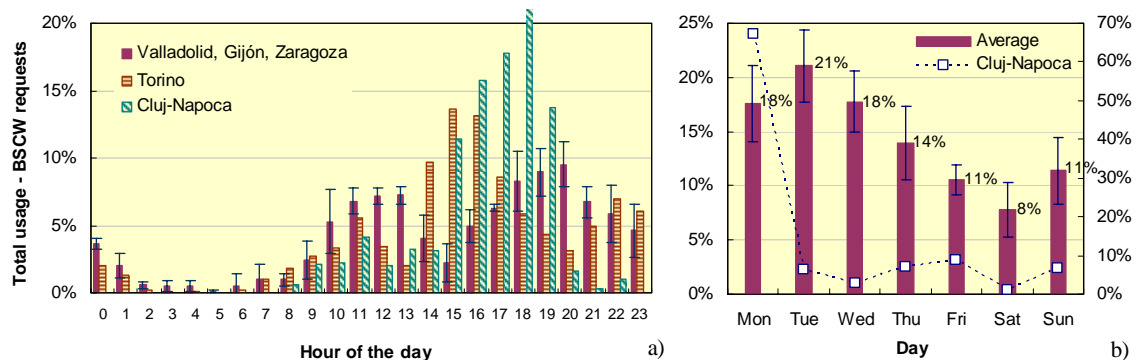

Fig. 1   Distribution of BSCW usage: a) per local hour of the day, b) per week day. In a) the bars show three different styles of hourly usage, depending on the institution students. In b) the bars show the average requests for all institutions excluding Cluj-Napoca University and the dashed line shows the requests for students from Cluj-Napoca. The segment on the top of each bar represents the corresponding standard deviation.

important use corresponds to Monday. Hence, the learners from this institution have mainly used the University campus one day a week to access BSCW. The learners from the other institutions have mainly used it on the first weekdays, though there has been a substantial use from home on weekends.
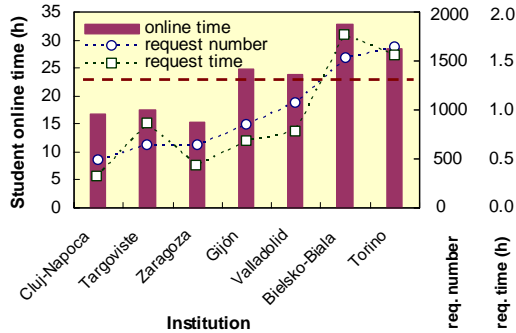

Fig. 2   Total time a learner has remained online to complete the course is showed by bars for every institution, corresponding the dashed line to the average time. The dotted curve with circles represents the total number of BSCW requests performed per student during the course, while the dotted curve with squares represents the total real time corresponding to these requests. The relative factors between both curves manifest the different line speeds used by the learners from each institution.

Fig. 2 shows that the online time a typical learner has employed to finish the course has been about 23 hours, a number significantly near the established course nominal duration (30 h). As can be seen, there are very important differences among institutions in the quantity of BSCW usage, even though the course is identical for everyone. This is a sign of the diverse tutoring styles used, as well as the different ICT learner expertise in the different institutions.
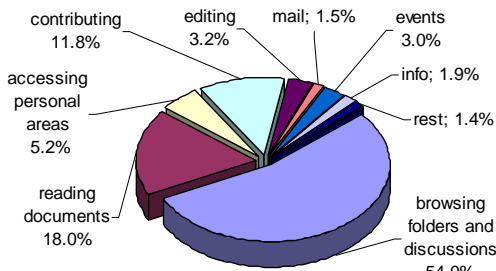

Fig. 3   Usage of different BSCW functions during the online course: "accessing personal areas" means accessing to private clipboard, waste, address book, calendar and public space; "mail" means sending mail operations; "events" means consulting recent workspace event details; "editing" means editing operations on information objects; "info" means consulting object details and system help. Note that it is not possible, only from system logs, to distinguish between browsing folders or discussions since the request path field has the same structure in both cases.

Fig. 3 shows that the most frequent BSCW operation used by students has been navigating workspaces. The significant smaller number of document readings indicates that in most cases learners have downloaded and printed documents for local study. The number of contributing, with new documents or discussion messages, and editing operations is about the same as document reading, which shows the importance of active student participation in the course. The scarce use of mail functions reveals the more effective user interaction by means of shared folders and discussions -see also Fig. 4.a)-

3.2   Student reactions to BSCW

Fig. 4.b) shows that students mainly perceive BSCW as an instrument for cooperation and not as a specific distance-learning tool, despite the fact that they only have experienced a distance course by using it.
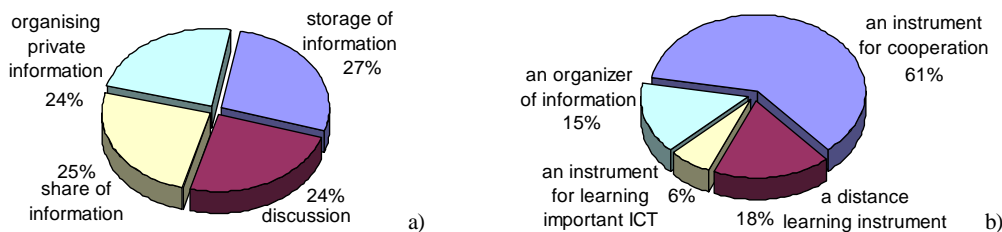

Fig. 4   Student description of: a) BSCW mainly used functions, and b) BSCW as an instrument of learning.
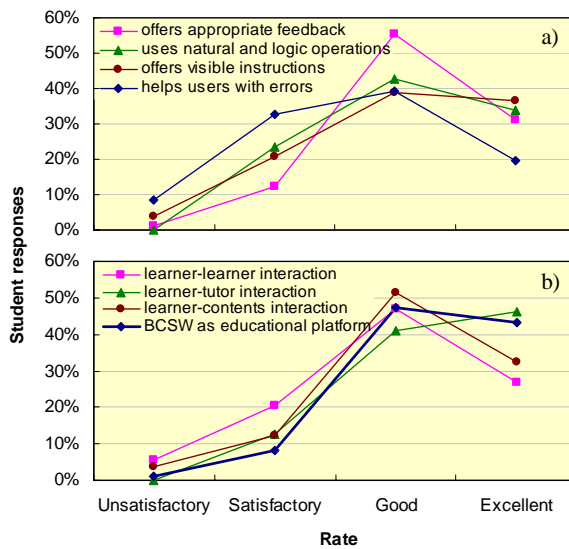
Fig. 5 Student evaluation of BSCW. Rating of several heuristic qualities of BSCW has been plotted in graph a):

- it offers appropriate feedback within reasonable time
- it uses natural and logical learning operations
- it offers visible instructions for using its functions
- it helps users recognize, diagnose and recover from errors in using the platform

Rating of interaction qualities of BSCW has been plotted in graph b):

- it facilitates learner-learner interaction
- it facilitates learner-tutor interaction
- it facilitates learner-contents interaction

A global evaluation of the usefulness of BSCW as an educational platform has also been represented in b).

In addition, Fig. 5 shows that about 85% of students have felt very comfortable with BSCW feedback, functions and interaction possibilities, and have described it as a good or excellent educational platform.

4. Conclusions

BSCW has been designed as a basic shared workspace system and probably it would be preferable that online learning takes place in a more specific Managed Learning Environment. However, this would force teachers to use different environments for different purposes, demanding an important ICT expertise from them. BSCW has a set of qualities that support a variety of educational possibilities, promote not only interaction between learner and instructor but also interaction between learners, and students feel comfortable using it from the working centre and from home. In addition, experience demonstrates that BSCW proves to be a very stable system and friendly to manage. Therefore, BSCW seems to be a more than reasonable choice for combining distance educational and group collaboration activities.

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