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New Objects in Formal Professional Learning: Replaying Meetings to Learn

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This paper explores the possibilities of on-line meetings in the context of a formal learning initiative, and how replays of these meetings have been used as Learning Objects to improve the professional learning experience. We report on a study of preparation meetings in professional learning in a formal context (pre-Doctoral Summer School), exploring how a formal learning group has used the videoconferencing system FlashMeeting™ and more specifically the Learning Objects generated by this tool. We investigate the results from a quantitative analysis of server logs and user feedback. We aim to provide insights into improving the use of Technology-Enhanced Learning in different environments, not only inventing new ways to learn but also enhancing traditional ones.

Keywords: Computer-Mediated Communication, Distance Education and Telelearning, Formal Learning, Learning Objects, Lifelong Learning, Technology-Enhanced Learning, Videoconferencing.

1 Formal Learning and Objects from New Experiences

It is now common-place to talk about new tools creating new forms of learning from our online learning experiences. Each new system we introduce seems to offer new modalities of communication, with new media and new ways to talk and share our knowledge. Most of these new oppor-tunities seem to offer us learning opportunities which are outside the formal and conventional channels of the books, classrooms and lectures that we are familiar with. Interest in non-formal and informal learning opportunities is grow-ing, and this work is presented by some researchers as a significant new force, particularly in fields such as profes-sional learning [1] [2]. Detailed research into the features of new systems and how they may influence informal learn-ing is a great challenge. The picture is complex, as learners still use traditional and formal learning channels together with the more informal and non-formal ones. Our work here is focused on how these formal, non-formal and informal

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environments complement each other by the creation and reuse of new Learning Objects.

Before designing any learning experience, it is crucial to define how we understand the learning resources that we can use [3]. It is now common to refer to these resources as "Learning Objects" (LO). An LO is:

- **A learning medium**. In other words, a complex whole that has an instrumental entity (such as an electronic document, a file) and a symbolic entity (including information, with a structure and a specific code and language).
- **On-line**, obviously in the technological sense of the word (referring to telematic networks, interactivity instrumental), but also in terms of professional networks, trainees, teachers, etc.
- **Reusable**, because it has been configured (instrumental and symbolically) to be used in different educational processes by various users.

In addition and following Wiley [4], this kind of resource offers the potential for reusability, generativity, adaptability, and scalability.

Most LO definitions have emerged from the different points of view of each researcher, and have a special emphasis on either one of the components of this concept, *learning* and *object* [5]. Some of them are putting greater emphasis on the nature of the objects of these new resources, such as mobility, usability, and so on [6] [7]; whilst others assign some importance to the educational aspects and how they work in different pedagogical environments [8] [9]. We will attempt to approach both aspects.

Our research focuses on how we are using these objects and how we can make better use of them in different environments, by not only inventing new ways to learn but also improving traditional ones.

2 The Study

The PROLEARN SUMMER SCHOOL (PSS) is an initiative of the PROLEARN academy <http://www.prolearn-academy.org> in the context of the PROLEARN Network of Excellence, a project funded by the Information Society Technology programme of the European Commission, which is focused on Technology-Enhanced Professional Learning, <http://www.prolearn-project.org/>. The Prolearn network brings together both academic and industrial partners with expertise in e-Learning, and has developed a number of cooperative learning and meeting/organizational tools to assist in its work. It is an annual event which has been organised to develop training and collaboration opportunities among pre-doctorate researchers in Europe and beyond. In 2007, the PSS took place in Frejùs (France) in May including fifty-eight students.

To prepare some of the lectures and workshops, the PSS organization team and lecturers prepared a series of on-line sessions for students using the videoconferencing tool FlashMeeting. These sessions have the principal objective of exploring the possibilities and tools around one of the key topics of the doctoral school. In addition, the students have the possibility to "meet" each other, have the first view

of the community and start building the sense of group.

There were five FlashMeetings during April of 2007, 90 minutes each, and with an average of 16 attendees: one lecturer and the students. The events are syndicated on the FlashMeeting public folksonomy <http://flashmeeting.open.ac.uk/public/key/prolearn-summer-school>.

The data we present here is from these meetings in this formal program of training (doctoral Summer School). Apart from the technical data, provided by the FlashMeeting system, we have collected questionnaire and an interview data.

The on-line questionnaire invitation was sent by email via the PSS distribution list to every participant. We recovered twenty-six answers, especially from students between 20 and 40 years (92%), 58% males and 42% females. In this questionnaire we asked for the possibility to have a short interview with each one of them using FlashMeeting. Finally, six semi-structured interviews were conducted in October 2007. All the interview data was recorded and transcribed verbatim. Thematic coding was employed and themes were generated inductively from the raw data [10].

3 The Video Meeting Environment

3.1 FlashMeeting™ Videoconferencing Tool

The FlashMeeting project research is part of the "PROLEARN Network of Excellence". FlashMeeting is a "lightweight" videoconferencing tool deployed gradually since 2003.

The FlashMeeting applet is implemented in Adobe Flash™, and works from within a Web browser. One user, the "meeting booker" arranges an event via a Web-page form, which generates a unique event URL. This URL is accessible for a live meeting at the booked time, and thereafter points to the recording of the event. The applet works best with a DSL connection and a webcam, but can function with a good 56k dial up connection and without a camera. Only one user may speak at any one time, via a simple queuing mechanism to take turns. Users may jump over the queue by "interrupting". The applet used by this community gave all users the same status and uniform access to all features. Users do not need to "log in" to the applet, they simply click on the generated URL, forwarded by the "meeting booker" who could be a professor, the course administrator or a normal user.

There is a single public text chat tab in the applet, a support to shared URLs to open the shared web page in all remote machines, a shared whiteboard available to share text, annotations or pictures, voting and "emoticons", all of which are common to all participants.

Every meeting in this tool is automatically recorded via the FlashMeeting Memo feature of this system <http://www.flashmeeting.com/memo/> (cf. Figure 1). Recordings are made instantly available to the subject community itself and the "Memo" replay provides a simple set of visualization tools to assist in the navigation and analysis of the event.

A map with the location of every attendee, the complete

Figure 1: PSS Meeting Details in FlashMeeting Memo™.

replay of the meeting, the "minutes" with every chat interchange, URLs exchanged, votes, names of attendees and annotations, as well as the linear and polar graphic visualizations of the chat and broadcast are available for each meeting.

Each part of every recording could be useful to get an idea about the meeting, its content, its shape and features. In the same way, each part could be used independently or in combination with the others to have a better visualization of the event.

3.2 FlashMeeting™ Replays as Learning Objects

Each meeting is recorded in the FlashMeeting Memo tool as an independent object, the FlashMeeting Replay. Each of these replays, together with their special features, could be used as an efficient Learning Object, gathering the most interesting LO basic characteristics: learning objective, digital format, reusability and some level of granularity. Figure 2 shows a screenshot of the Memo recording applet replaying a PSS preparation meeting. The horizontal bars towards the bottom of the figure show the broadcast video segments of the most active

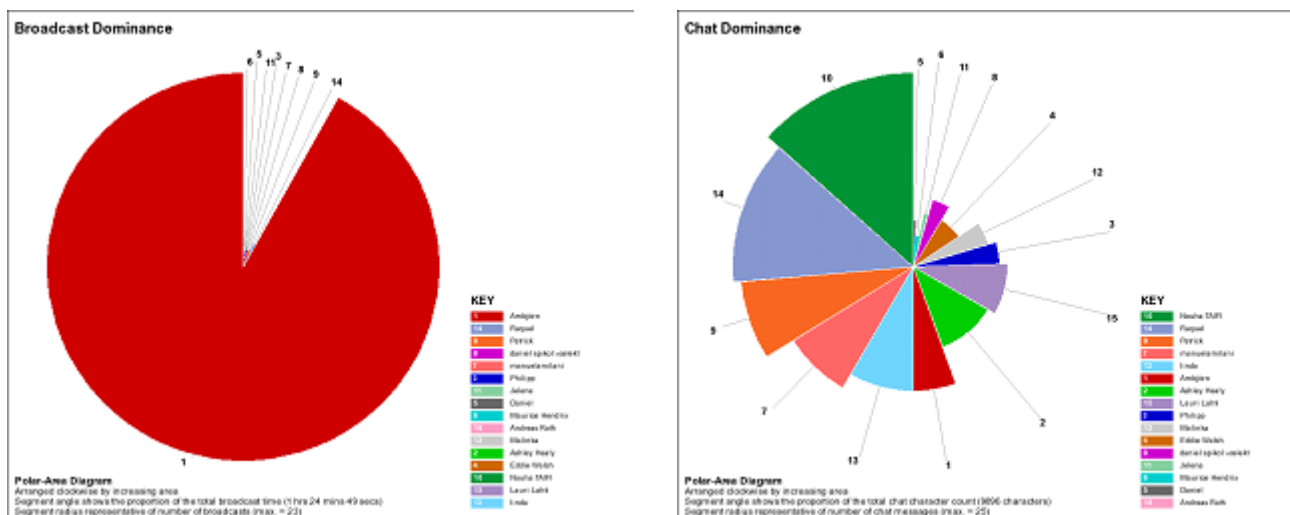**Figure 2:** FlashMeeting Memo Applet Showing a PSS Event.

Figure 3: Chat Dominance and Broadcast Dominance of a Pre-PSS Meeting.

six participants in this event. Each horizontal line represents a speaker in the event. The linear visualisation presents the speakers in the order of the proportion of the event that they are speaking. The interface allows this area to be "scrolled down" to reveal the contributions of the remaining participants. In this case, the top line shows the teacher who spoke the most in this event.

The community considers the meeting mainly as a learning interchange. However, the meeting can be a learning event in more than one modality. At present, over 6,000 naturalistic on-line meetings have been recorded, attended by different communities: academic seminars, project meetings, peer to peer learning meetings, distance lectures, interviews and others [11] from a wide variety of formal, non formal and informal learning [9].

In each FlashMeeting replay all participant actions are logged and time-stamped. Once finished, the booker can "make invisible" some pieces to clarify the important content of each event if it is crucial for future use. In addition, each action in the meeting (broadcast, text chat, URL sharing, etc.) is a "tag", which can be joined to the meeting replay URL to jump to that time in the recording. The applet allows users to click on any part of the visualisation to replay from any point, and to pause or jump from the controllers below the video window. In addition, the text chat (shown in the right hand top pane) is time-stamped also, and can be used to jump to the point in the event when the text comment was made.

This interface allows the student to navigate through and browse the recording data very efficiently and makes easy the reuse of each replay, in different moments and for different learning models according to the special conditions and requirements of each user.

4 Formal Learning in Live-Events Vs. Objects to Learn

As we would see in the example showed in Figure 3,

and according to the classification made by Scott et al. [12], the analysed meetings have a very strong shape of "remote lecture". The key part of broadcast is dominated by the lecturer (almost 90%), whilst the chat is evenly dominated by the students, who ask questions or comment on the content.

As previously mentioned, on average 15 students have participated in each meeting (26% of PSS students). The questionnaire answers indicate that 21 students (81%) have participated in at least one event, and 7 people (27%) attended three or more live-meetings.

The content of these meetings was very important to understand the live lectures in the PSS. In addition, the students had the opportunity to meet each other and to start working on the PSS topics. Most of them consider their active participation in the online seminars as a useful opportunity: "*I decided to participate in these sessions, because I thought these meetings could be a very nice opportunity to know the other people and to know the specific topic that we were studying.*" (student interview).

"*It was really useful… the possibility to be with other people, with the same interests as me, with a good professor, to have a good introduction in a very interesting topic … And without moving myself from my office!!*" (student interview).

The participation in these meetings encouraged the students to build a sense of community before the live event. Nevertheless some students had some ideas about the key factors to improve this sense.

"*Did these meetings make you feel part of the PSS community before going to the summer school? Yes, for sure.*" (student interview).

"*I think the teacher has a key role on this…The reason I have felt as part of the PSS in these meetings is because of him (the teacher), before each meeting he offered help to everyone and had a little chat with us, asking about our interests, work, etc.; so, I think his role was crucial.*" (student interview).
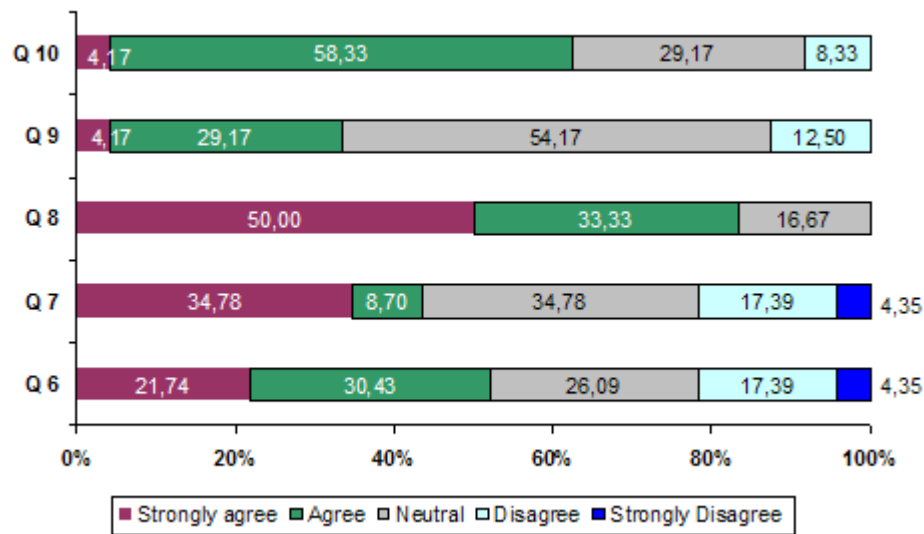
Figure 4: Questionnaire Items 6 to 10. Answers.

The questionnaire answers show that 7 PSS attendees (27%) have not reused any event as an LO, while the same amount have attended 3 or more events. Nevertheless if we pay attention to the individual data, PSS attendees who have not participated in any of these meeting did not replay any meeting, and some who participated in 3 or more have replayed more than 2. Thus, no relationship was detected between people who participate in meetings and people who reused it.

In the questionnaire items 6 to 10, we explore the PSS attendees' experience of replaying the PSS events (cf. Figure 4): Why they used it, how they use it and what kind of impressions they had from the experience of replaying these meetings.

The items used were:

Q 10: Replays have helped me understand more about the work of other students with respect to the PSS.

Q 9: Replays have helped me understand my work in the context of the PSS.

Q 8: I looked at replays to learn what happened in a meeting I could not attend.

Q 7: Replays have helped me pay attention to things that I missed in the live meeting.

Q 6: I looked at replays to remember what was said at the meeting.

The PSS attendees have replayed especially the meetings that they have not attended, and used the replays to remind themselves of the content of the meeting. Interestingly, most interviewees did not admit replaying the meetings to detect content they "missed" in the live meeting; indeed when they answered our questions about how they replayed the meetings, they had two different ways of replaying: usually PSS attendees, who did not participate in a live online event, watched the recording chronologically, while those who attended it replayed specific "crucial" moments or "jumped" to interesting data:

"*I have replayed both, I have replayed those where I was in the live meeting and the others in different ways. For example, I have replayed all the meeting when I have not participated, to know what they have done in it. BUT I have only replayed SOME pieces of the meetings when I was in the live, some interesting ones, for example how Collaborilla works, or some URLs interesting to my work, specific explanations of terms about modelling...*" (student interview).

Overall, the event replay is a Learning Object used to revise the "lesson" for these students; it is a resource to check again the key contents and continue learning.

"*Helps writing minutes; helps to catch up with missed meetings... you don't lose an event and its contents.*" (student questionnaire).

Additionally, these meetings are public, which means they are available to a worldwide community who can replay and learn from them. Since the start of the meetings, in April 2007, to December 2007 the five meetings have been replayed an average of 70.8 times each. For example, the first meeting had 17 attendees and has been replayed 93 times from a big variety of countries around the world. Figure 5 shows the live attendance map of this meeting, plotting the IPs of meeting participants in red dots, and the replay map, representing the IPs of replay viewers in blue dots. These replays are indeed Objects to Learn formally for the PSS Students, but they could be also a good LO for other people with the same interests, in this case in the informal way. Since the replay is publicly available for everyone to view, it has been viewed by people outside Europe, who did not participate in the PSS.
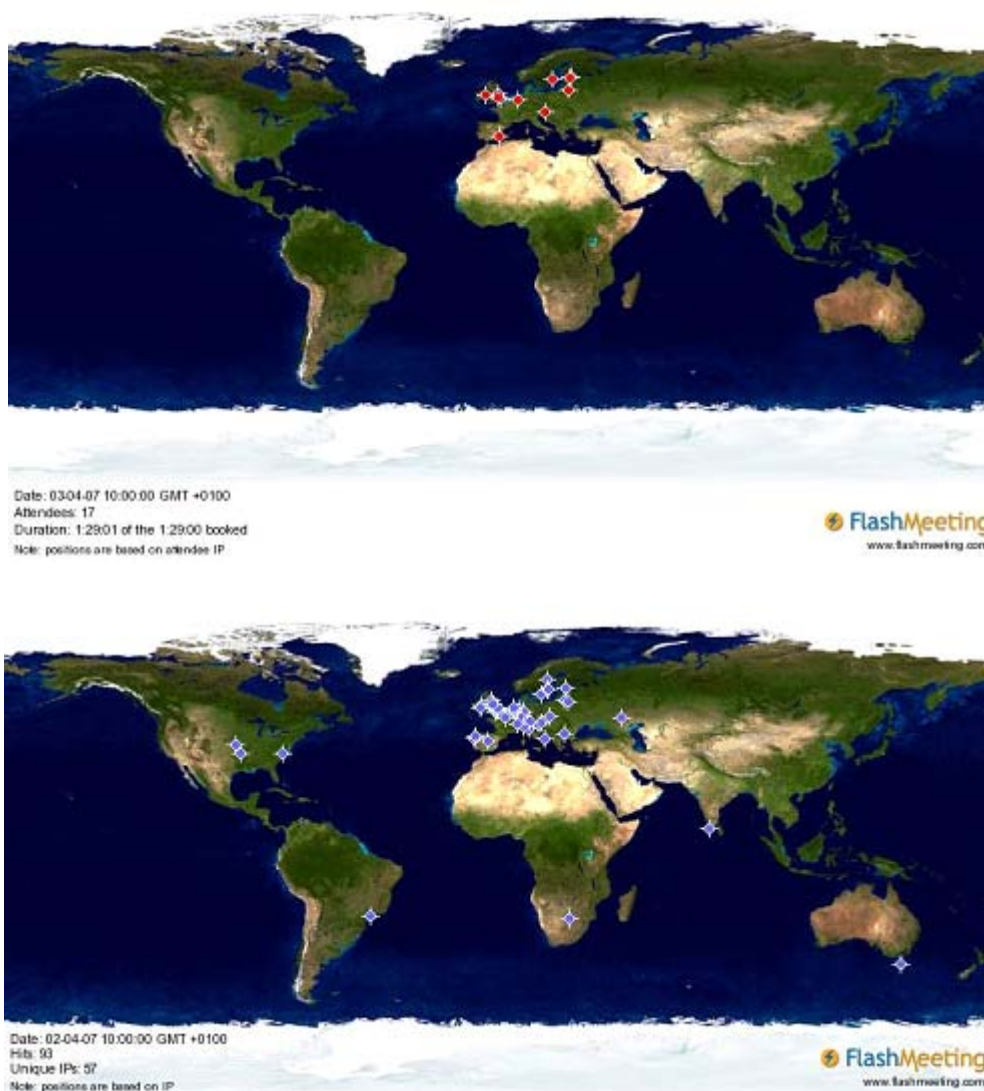
Figure 5: Localization Maps with Attendees and Replay Viewers of First Pre-PSS Meeting.

Furthermore, the tool was used to enhance collaboration between students of similar research interests. The PSS students feel the importance of understanding better their research connection with each PSS participant. The replays have been used to situate each participant's work and how it is related to the topics in the PSS.

"*It helped to understand what was important for the others and to get to know the others.*" (student questionnaire).

At the same time the replays provided students with information about the people involved in the PSS, not only as knowledge workers or professionals, but also as partners.

"*Some of us used to be the same during the FlashMeeting and are able to more or less give to the others a good picture of who we are. Other people behave in different ways online during a FlashMeeting or in a face-to-face full-time session like the PSS.*" (student interview).

"*You can build a pre-opinion about people… is not a*

strong opinion, but is an opinion about their role, or personality." (student interview).

5 Discussion
This study explored how a formal learning group have used a videoconferencing system, and more specifically how they used the Learning Objects generated by this tool. This new tool has been used in some novel ways, but via a traditional learning model. This "semi-traditional" way to learn from a new tools is a very interesting way to analyse future opportunities in Technology Enhanced Learning.

These students have benefited from the use of this tool in the context of a pre-doctoral school. Most of the PSS attendees who replied to our questionnaire participated in this optional activity of virtual meetings, in at least one live-meeting (21 people, more than 36% of the total of students of the summer school) of 90 minutes duration. They used

the tool to learn from the lecturer and to also have a first contact with their future course-mates. The role of the lecturer as facilitator and motivator was crucial to improve the students' experience. Students found the use of this tool very appealing, giving them the opportunity to see each other at a distance easy and comfortable.

Nevertheless, the use of replays is also important. The largest percentage of our sample have used the replays as a LO to remember the key content of the meetings they participated before and to explore the content of meetings they have not attended. They benefited from the possibility to "jump" in the timeline changing the complete LO to a granular Object which could be used as the whole element or used in different parts as independent elements.

Furthermore, the replays have not been used only by PSS students. The possibility to provide this content in public has allowed other people from different countries to take advantage of the knowledge transferred in them. In conclusion a formal Learning Object used in a traditional way of teaching and learning, could be used from other people in an informal way to learn in an informal dynamic. A great interest from the educational technology research is related to the aspects of informal and non-formal learning as they possibly are the most exciting ways of learning for current exploration; their investigation is our challenge for the future. Nevertheless, Technology-Enhanced Learning is still at a distance form traditional ways of learning. Students are still learning in formal environments, as in the past, and everyone needs a formal qualification provided habitually by formal educational institutions. It is necessary to investigate how new tools work in these environments and how the traditional ways of learning are changing by the use of these tools and for current students. Last but not least, it is useful to explore how these formal, non formal and informal environments complement each other by the creation and reuse of new Learning Objects.

Acknowledgements

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