

# UnderstandIT: A Community of Practice of Teachers for VET Education

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Keywords: Communities of Practice, Social Networks.

Abstract: Social Networks are among the most popular achievements of Web 2.0. As a matter of fact, the Internet is full of social communities like Facebook or Twitter or others, which are used not only by teenagers but also by older users to share experiences, information and opinions. The expression Social Network allows for a wide interpretation, coming from the research in social and behavioral sciences. It also lends itself to encompass a kind of more thematically vertical communities, namely Communities of Practice, where groups of people interested to learn a particular practice are supported in achieving this goal thanks to the professional relationships with expert peers. The community network evolves with time, as novice users become experts in turn, and new communication protocols arise. We start from the consideration that most high school students nowadays use Web 2.0 instruments and tools for chatting, streaming or posting messages. An interesting challenge is the possibility for teachers the use of the same instruments and tools to enhance their daily work. To this aim, we present a first study of a Community of Practice of teachers, involved in Vocational Education and Training (VET), aiming at learning the use of Web 2.0 tools and applications to support the learning process of their pupils. In practice, we propose to use Web 2.0 to learn to teach through Web 2.0. As a platform we used the web application ELGG, that is an open source social network engine thanks to which we built a social environment where a sample of VET teachers participated to several social activities. A first evaluation of effectiveness of such an approach is encouraging.

## 1 INTRODUCTION

The expression Social Network was born in the field of social and behavioral sciences and soon acquired a weight of its own. A lot of research has been spent to analyze these social structures made up by a set of individuals or organizations and their (dyadic) ties (Wasserman and Faust, 1994). Thanks to technological progress and, most of all, to the spread of the Internet and to the rise of Web 2.0 protocols and frameworks, the same expression is nowadays mostly referred to virtual places for sharing information, opinions, data and whatever among connected peers of a community. In practice a Social Network (SN) is a set of people or groups of people with similar pattern of contacts or interactions such as a friendship, co-working, or information exchange (Radicchi et al., 2004). In this scenario, individuals register into virtual communities for different purposes: to know other people, to share daily experience with *friends* in a sort of shared virtual diary, but also to exchange

professional knowledge, to learn about particular topics and so on. Among the most populated SNs, we can mention *facebook*<sup>1</sup> for contacts, texts or messages sharing, *YouTube*<sup>2</sup> for video sharing, *LinkedIn*<sup>3</sup> for job posting and sharing and their number is continuously growing. *Communities of Practice* (CoPs) can be considered as an especially vertical kind of SNs where members enroll to reach some goals related to very specific topics in particular domains, typically concerning their work or even a kind of hobby (Wenger, 2010). CoPs are groups of people who share an interest or a passion for something they do, and aim at learning how to do it better by interacting regularly. They are not merely clubs of friends or networks of connections between people, but rather own an identity defined by a shared domain of interest (from the Wenger web site<sup>4</sup>). Here we present a par-

<sup>1</sup>[www.facebook.com](http://www.facebook.com)

<sup>2</sup>[www.youtube.com](http://www.youtube.com)

<sup>3</sup>[www.linkedin.com](http://www.linkedin.com)

<sup>4</sup><http://wenger-trayner.com/theory/>

ticular CoP, called *UnderstandIT*<sup>5</sup> from the European project inspiring it, having Italian *Vocational Education and Training* (VET) teachers as members. Their common goal is the learning of the best practices to use some Web 2.0 instruments and tools, such as forum, chat and wiki, in their daily teaching activities. This project arose from the need to bridge the gap between the use of Web 2.0 by teachers, compared to that by pupils, and to make digital immigrants (the former) and digital natives (the latter) encounter in a common ground (Prensky, 2001). In fact, the underlying hypothesis is that the use of these tools has great potentialities to make teaching more effective. In the original European Project, teachers of different European countries (Lithuanian, Italians, Portuguese, German, Danish, and English) used a CoP to reach the same professional goals. The UnderstandIT CoP was designed following the Wenger's schema, based on the concepts of *domain*, *community* and *practice* (Wenger, 1998). The domain of shared competence addressed here is the teaching activity for VET education; the community members are VET teachers while the practice is the use of the Web 2.0 instruments and tools in the teaching activities. In addition, peer-mentoring as well as peer-coaching are adopted, since they are widely recognized as winning strategies, most of all when learners are teachers in their everyday life. However, coaching is an art, that implies carefully tuned presence/absence of the coach, to spur coachee's abilities regarding critical planning, and an accurate evaluation of obstacles and related overcoming activities. We used the open source ELGG social network engine<sup>6</sup> as a platform, since it is one the most used frameworks delivering the building blocks that enable companies, schools, universities and associations to create their own fully-featured social networks and applications. This engine runs as a web application, providing a social environment with a wide range of Web 2.0 services such as forum, chat, wiki and so on: members are free to create wiki activities and to participate to all the social activities put on line by the platform. The research question of our work is to test if such a *reflexive* approach to the learning of Web 2.0 really helps the teachers of the UnderstandIT community to learn and to teach. The powerful message carried by the learner centric model can be enhanced by enriching the role of the teacher to include greater individual support and guidance for the learners (Quintana et al., 2001). The remainder of the article is structured as follows. Section 2 draws some important related work; Section 3 shows the system, i.e., the social network engine which the CoP is based

on. In Section 4 the social network along with its evolution is shown while Section 5 presents the experimental evaluation of the overall system. Finally in Section 6 some conclusions are drawn.

## 2 LITERATURE REVIEW AND RELATED WORK

Even if it is not possible to determine the exact birth of the modern interpretation of CoPs (see for example (Bourdieu, 1977) and (Vygotsky, 1978)), it is indubitable that its success has been significantly supported by the works by Lave and Wenger (Lave and Wenger, 1991; Lave, 1991). The main stream of innovation has been related to riding out the idea that work practice must be conservative and stable in time and learning must be taken separate from it and be focused on the most static aspects. One of the factors supporting this has been the concrete understanding that the ways people actually work are usually different from what described in manuals, training contents, and job *theoretical* descriptions. Differences are related to both complementary as well as completely alternative strategies and rules. Nevertheless, it has been noticed that organizations tend to rely on the *static* form of training in their attempts to understand, improve, and transmit work practice. On one hand, this kind of behavior was generated by a society structure recognizing a special value to *abstract knowledge*: the practice details are considered as contingent, and therefore less essential, or at least easily derived after the relevant abstractions. It is to say that the above conventional theory of learning and most of all of training is far from the ancient institution of the artisan workshop, with their primary role in transmitting and preserving arts and crafts. However, the industrial era took this prevalence of abstract knowledge over actual practice and to separate learning from working, as well as learners from workers. By contrast, the new theories returned to the *ancient wisdom*, suggesting that appropriate practice is central to work understanding, and that abstractions detached from practice might even distort or obscure less trivial details of practice. Further, they assigned a special role to social exchange of experience and information. Transferring these considerations to learning was quite immediate, also due to the theories of Vygotsky (Vygotsky, 1978) and of the other researchers in the line of socio-constructivism. Lave and Wenger built on a practice-based theory of learning, which has its core concept in the *Legitimate Peripheral Participation* in CoPs (Lave and Wenger, 1991). The novices enter the community from the pe-

<sup>5</sup><http://understandit.di.uniroma1.it/>

<sup>6</sup><http://elgg.org>

riphery, yet over time move towards full participation by acquiring experience and reputation. However, the community itself also moves through stages of development which are characterized by different levels of interaction among the members, and also by different kinds of activities. This concept provided one of the most versatile accounts of the constructive view of learning, even if it is not actually a method of education. Its focus is on learning, rather than on teaching (Wenger, 2010). It is interesting to consider that a topic formerly focused on organizational learning, at present deserves an increasingly significant role in any learning field. Moreover, firstly the spreading of the Internet, with early forms of forums, and secondly of modern SNSs, supported by Web 2.0 technologies, have further supported the possibility and spurred the inclination to exchange on virtual communities not only personal data but also working experience and learning difficulties. With the creation of dedicated software frameworks, CoPs have become one of the most appreciated forms of social learning (Blackmore, 2010). In recent projects CoPs have also been used to implement career education networks, aiming at supporting an aware transition from school to work and/or further education, requiring a lot of information from a wide range of sources. In this new perspective, learning is both the main activity and the core topic which is supported by the CoP strategies. Buysse, Sparkman and Wesley (Buysse et al., 2003) underline *the growing need to integrate educational research and practice* to connect what we know with what we do. However, they underline that shared lists of recommended practices often fail to promote the personal responsibility and exploration ability of all involved stakeholders, including not only educational researchers and teachers but also parents and students. Every member of the educational community should be encouraged and motivated to analyze and possibly criticize, in a constructive way, each other experiences and teachers should be engaged in research activities as well. We consider CoPs a very promising environment to reach this goal, to joining-research and practice, among which they mention action research (Calhoun, 1994), or professional development schools. The trick is breaking *the linear relationship through which information is handed down from those who discover professional knowledge to those who provide and receive educational services* (Buysse et al., 2003). The two central elements of the CoP approach are: i) situated learning (Hummel, 1993) and ii) community reflection on practice. Knowledge is acquired from and applied to everyday settings, and is discussed with peers and experts that made up a social system (Wenger, 1998). Other ap-

proaches concern: i) the personalized learning where the added value is given by a didactic capable to tailor its patterns to the learners' specific needs, such as in a formal education (see for example (Limongelli et al., 2011a; Limongelli et al., 2008a; Limongelli et al., 2011b; Sterbini and Temperini, 2010) for an insight into this area) ;ii) the ontological approach where teachers are helped by ontology-base systems in order to search for suitable didactic material in the Internet (see (Limongelli et al., 2010; Limongelli et al., 2012; Limongelli et al., 2013b; Limongelli et al., 2013a)). Moreover, in a perspective of technology enhanced learning, there is some research work (De Marsico et al., 2011; De Marsico et al., 2012) aiming to integrate more traditional individualized e-learning and social-collaborative e-learning (Sterbini and Temperini, 2009; Limongelli et al., 2008b). The project closest to our work is the *SEDA* project, that is a network of people engaged in staff and educational development. In (Nixon and Brown, 2013) a CoP for educational developers has been proposed, highlighting the needs for teachers of sharing their experiences. In our work we focus our attention on a specific objective that is the involvement of teachers in the use of Web 2.0 tools as vehicles for captivating learners.

### 3 THE SYSTEM

The design of the system started from the requirement analysis, based on an input coming from a sample of VET teachers to identify a list of useful features to deploy:

- Groups common goals sharing and shared editing tools;
- Friends, groups, stream of interactions and event calendar and RSS feed import;
- Antispam protection;
- FAQ managing;
- Activities sharing among friends;
- Embedding external contents;
- Tracking changes/hot topics;
- Synchronous (chat) and asynchronous (blog, page, comment, tweet, forum) communications.

Subsequently we analyzed several open source environments and selected the ELGG framework. ELGG is a *LAMP* (Linux, Apache, MySQL, Php) web application that provides a basic set of services for a social network system, allowing for a complete interface configuration and extension of the functionalities (by adding plug-ins that are either newly implemented or

selected among the many already available from the ELGG development community). Finally, the system has been deployed and customized to satisfy the above requests. In SNs members share and exchange knowledge by adding a new bookmark, posting a link to a particular video, publishing new pages and so on and people might feel the need to know those members of the community that are interested in sharing that knowledge. So, among the several features offered by a social networking platform, of special relevance is the setting of access rights associated to each contributed resource. In particular, the author of a contributed resource can specify a *group* (a *class of users*) to whom release either *read access* or *read and write access* rights on the resource. The *group* is a subset of the CoP members; there are several possible group specifications available (listed from a more public to a more private nature): *Everybody*, *All registered users*, *A Group*, *All your friends*, *A subset of your friends* and *Private*. Depending on the write access rights of a post, the contributed contents can be edited asynchronously by different users. Each post in the system can be tagged by the author, i.e., it can be associated with one or more keywords. This allows for searching through the system resources by both *full text* and *tag-based* selection. Another characteristic of the system is that the UnderstandIT CoP has been configured in such a way to allow for discussions in several language-specific communities, as mentioned in Section 1, with a common discussion space in English. This feature has been implemented through the concept of *Group* managed in ELGG, where a *Group* is a subset of all the CoP members that is owned by a member and can be moderated. Each group represents a (sub-)community whose members interact through:

- Group Blog posts, Group Bookmarks and files and Group pages (in particular the editing of sub-page trees was made easier through an appropriate plugin);
- Possibility to embed videos/podcasts and RSS feeds and to upload resources through the *File Tool* feature (with the organization of files supported by the File trees plugin);
- Possibility to embed external content by reference through the Media Tool;
- Possibility to add (asynchronously) comments on posted resources (files, media, bookmarks and blogs);
- Possibility to share interesting resources through the Bookmarks Tool;
- Possibility to monitor (import) RSS feeds through the Feed Tool;

- Management of Forums and Chats.

Moreover, in order to increase the support to collaboration, a synchronous shared editing plug-in has been installed. It is based on the *Etherpad* open source project <sup>7</sup>. Through this plug-in the Group members can share the editing process on the same document, i.e., members can cooperate (also by using a small chat) through:

1. Normal (wiki-like) pages, with the support to comments and revisions;
2. Shared (etherpad) pages, which allow for: i) synchronous editing as *Google docs*, where each editor's input is differently highlighted; ii) replay to all changes/revisions; iii) export/import to/from documents in various formats (rtf/doc/odt/html/pdf).

Users of the CoP are kept updated about the CoP activities either through automatic e-mail notifications or by means of the CoP web interface. Both the former and the latter collect information from many relevant areas of the network, and offer appropriate notifications, such as in the following:

- E-mail, RSS feeds, status tweets;
- Last changes in page history;
- Group activities;
- Last changes in the user's *dashboard*;
- Last changes in the main CoP's page and in each Group main page;
- Contextual tag cloud providing information about the terms used in the CoP and their location.

To make spammers' life harder an ELGG plug-in has been selected and installed and members can report occurrences of spamming to the administrator, who in turn can remove the spammer and add username and e-mail to the global [stopforumspam.com](http://stopforumspam.com) database. To externally disseminate the CoP discussions towards Twitter, a plug-in has been installed to broadcast tweets generated by the CoP users.

Since the original UnderstandIT CoP was born in the context of the European project with the same name, its interface was to the languages of the UnderstandIT project partners (Lithuanian, Italian, Portuguese, German, Danish, and English). To allow for cooperation among different language groups, an automatic Google Translation-based tool has been installed in all pages. Partners have found the Google-translator tool sufficient to understand the knowledge posted by other language people. This was an interesting experiment for international courses, and for inclusion of contents in foreign languages.

<sup>7</sup><http://etherpad.org/>

## 4 THE CoP ACTIVITY

In this section we show some main activities of the CoP members. We describe participants' interactions about their collaborative activities by means of the social Web 2.0 communication tools described in the previous section, i.e., forum, blogs, FAQs, and so on. In particular, the UnderstandIT CoP was used as a container for an online course deployed adopting peer-to-peer coaching and mentoring strategies. For the reader's sake, from now on we will use UnderstandIT as a name for the course too. This course was attended by a sample of 64 teachers, coming from different didactic experiences, as shown in Fig. 1. Intentionally we randomly selected the sample of teachers from different educational institutions in order to obtain a significant set of teachers.

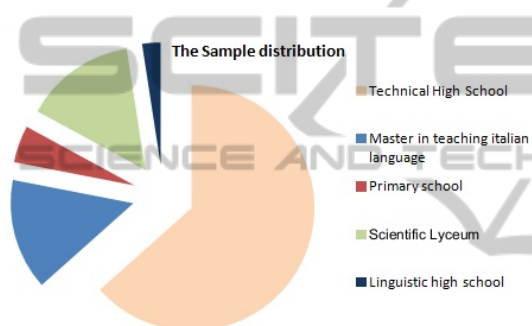


Figure 1: The sample distribution of the didactic work experiences of the CoP members.

The overall learning outcome was: *I can choose relevant resources using the CoP approach for any planned learning activity including ICT-tools where these are the most appropriate and I am able to change my teaching style in order to use a more coaching oriented approach.* In the following we show the detail of learning outcomes of the course that have been proposed in English and Italian.

### Detailed Learning Outcomes

1. Information sources: I can help my students to find and evaluate relevant information including pictures, maps, sound and video from ICT sources as well as traditional sources. (e.g. RSS-Feeds, Wikipedia);
2. Information storage: I can help my students to store information in digital form such as blogs, wikis, podcasts or portfolios (so it is accessible at home, on the move and to external experts/advisors);
3. Communication: I can help my students to communicate synchronously and asynchronously through text, voice and video;
4. Documentation: I can author online spaces to document learning events and facilitate student use of this material afterwards (e-portfolio, screen casts, class blog/wiki);
5. Safe use: I can help my students to use online applications safely (e.g. online identity, privacy, trustworthiness);
6. Group work: I can facilitate online group working, using methods such as complex instruction;
7. Learning: I can identify the learning outcomes by using specific ICT tools in a specific learning activity;
8. Assessment: I can identify how the learning outcomes of ICT related activities will contribute to student assessment and use appropriate rubric tools to record this;
9. Planning: I have made a plan for my continuing professional development in the use of ICT in my teaching;
10. Documentation: I have documented the use of an interactive internet tool so that others can benefit of this;
11. Sharing: I have tried at least one way of sharing my ICT experience with either internal or external colleagues;
12. Local context: I have identified possibilities/limits of the use of interactive Internet tools in my institution;
13. Portfolio: I have started or added to an existing e-portfolio;
14. Evaluation: I have evaluated the outcomes of my amended teaching session and documented this in my e-portfolio;
15. Coaching: I have embarked on peer coaching with one of my colleagues;
16. Coaching: I have the skills of listening and questioning to be able to coach other people.

The main achievements of such a course were basically in the deeper appreciation of the amount of work required from teachers in order to timely deal with the assigned tasks, and in the knowledge about which parts of the course need localization and/or translation, given that this is feasible (e.g., external material in pdf is heavy to completely translate). The course included several tasks such as:

- Practice with Web 2.0 tools for doing and analyzing one's own teaching;
- Analysis of existing CoPs;
- SNs and blogs to coach sessions with the course tutor and with peers;
- Final composition of a plan to experiment one's learning outcomes in her present teaching activity.

The visits of the CoP members at the web site, over the entire duration of the course, were about 2,000, distributed as shown in Fig. 3, i.e., in average 31.25 visits for member. In Fig. 4 the tag clouds concerning the Blog and the Bookmark activities are shown. Finally, in Fig. 5 we show the overall CoP activity in terms of a standard metrics like the total number of posts in the forums, the total number of FAQs and so on. All the above activities show that the members

have been engaged enough in the CoP life. In particular for the blog activity we see that there have been posted 90 discussions and 700 posts as shown in Fig. 5. Fig. 2 shows a view of the system interface and an example of a group interacting through group blog.



Figure 2: At the bottom an example of interaction among peers, at the top the home page of the course.

## 5 A FIRST EVALUATION OF THE CoP

In this Section we present a first descriptive evaluation of the CoP with the aim to measure the degree of satisfaction of the members with respect to the community activities and reasoning on the effectiveness of the CoP. Evaluating a CoP is not a trivial task: it is easy to get overwhelmed with the variety of evaluation approaches and metrics available. Once an online community of practice becomes active, leaders need to develop an evaluation plan to understand and

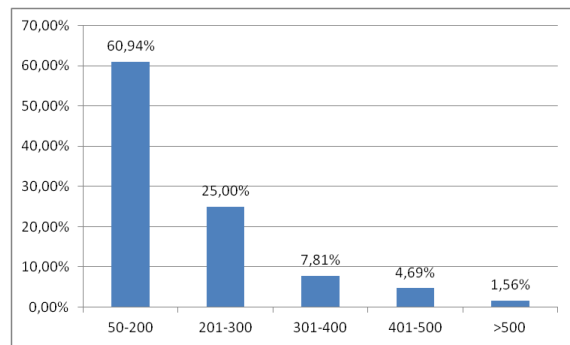


Figure 3: The total number of visits.



Figure 4: The tag cloud of the bookmark activity.

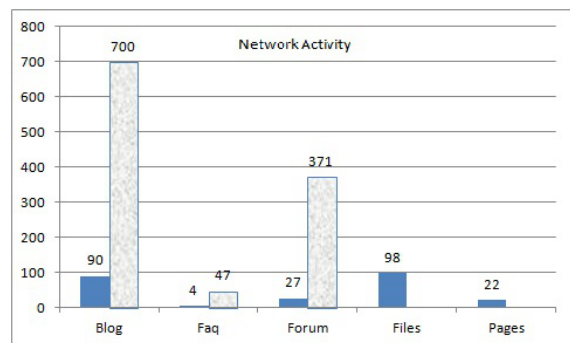


Figure 5: The overall CoP activity. Blue and grey bars for Blog, Forum and Faq represent their total number while their grey bars represent the total number of answers to them. Files and Pages bars represent their total number.

document success in their community. In many contexts, evaluation approaches, which measure communities activities and performance, are also referred to as *metric analysis*. Here we show the evaluation of the CoP performance by means of two key activities submitted to the CoP members, represented by a pre- and a post-test questionnaire.

### 5.1 The Pre-test Questionnaire

Through the pre-test questionnaire we measured some general variables like the members experience on the use of Web 2.0 tools. It was based on 16 questions concerning mainly the learning goals, the starting ICT and Web 2.0 skills and the work experience. Interesting questions were:

1. Have you ever participated to online courses to date?
2. Have you ever participated in Communities of Practice online?
3. Which of these tools (forum, chat, blog, rss,...) do you use or have used at least once?

More than 70% of the members had already participated in an online course and in the same way the majority of the sample, i.e., the 71%, had not experience in CoPs. On the other hand, Fig. 6 shows that the majority of the members had experience in the use of some Web 2.0 instruments like forum, chat and blog.

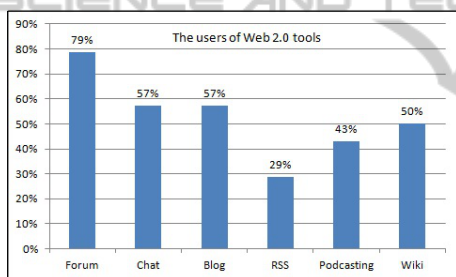


Figure 6: The answers to question 3: the Web 2.0 skills.

According to the above considerations, taking into account what shown in Section 4 as well, we can conclude that the sample of the CoP members was very articulated with an average skill on Web 2.0 tools.

### 5.2 The Post-test Questionnaire

Here we present the results of a questionnaire submitted to the CoP members after having taken the course. It was composed of 21 questions concerning different aspects of the didactic experience. We report two important questions:

1. Did the course meet your expectations?
2. Do you feel yourself prepared to act as a coach to your colleagues in the use of Web 2.0 tools?

We used a 5-points likert scale to measure the answers. From Fig. 7 we see that the 62% of teachers has been satisfied by the course: it met their expectations. This is a very important key for the success of any course. Finally, Fig. 8 is a first proof of the

effectiveness of the course. We discussed with the teachers about an aspect which is worth mentioning. The *reflexive* use of Web 2.0 to teach Web 2.0 technologies was found particularly engaging, so that this can be considered as a point in favour of adopting this approach on a larger scale. The added value is that using the same tools that the student is learning to exploit reinforces the final achievements and is much more engaging, along the line of *learning by doing*.

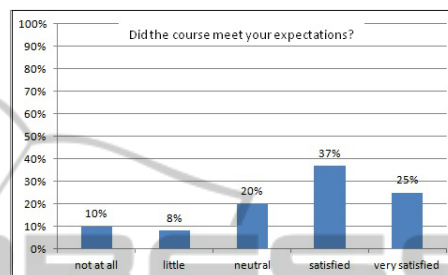


Figure 7: The answers to question 1: the expectations.

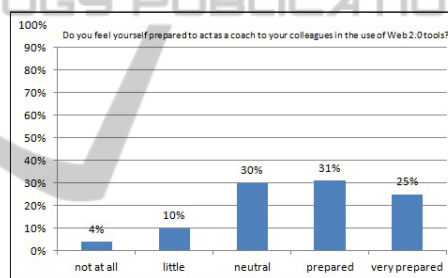


Figure 8: The answers to question 2.

## 6 CONCLUSIONS AND FUTURE WORK

In this paper we presented a CoP of teachers, called UnderstandIt, to learn the Web 2.0 instruments and tools. We implemented the CoP by means of the social engine ELGG and the community ended its learning process few time ago. Here we show the first results of such an experiment, showing both the network activity and an evaluation process, performed by means of the submission to the CoP members of two questionnaires, the pre-test and the post-test questionnaires. The first results are encouraging: the majority of the members feel prepared to coach other colleagues to teach Web 2.0 instruments and tools in their didactic activity and feel the course met their expectations. As a future work we plan to do a deeper analysis of the log data together with taking into account all the statistical correlations between the pre

and the post activity questionnaire in order to make other measures of effectiveness, test-based as well. Also we plan to repeat the experiment in a broader context.

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