CAN THE WEB IMPROVE THE EFFECTIVENESS OF PERSON-CENTERED LEARNING?
CASE STUDY IN WEB ENGINEERING AND BEYOND

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ABSTRACT
The fundamental hypothesis underlying this research is that web-based services have the potential to make didactic styles leading to deep learning processes, such as Person-Centered Learning, more effective and hence more feasible. Recently, we complemented the Person-Centered Approach by elements of e-Learning, claiming to strengthen the advantages of both constituents. In this paper we characterize the resulting style we refer to as Person-Centered e-Learning (PCeL), present a case study on a group project in Web Engineering, and give a perspective on further research. In this context, we found that the situated usage of a learning platform is essential for determining its actual contribution. Furthermore, students’ reactions indicate that PCeL has the potential to increase students’ motivation, interest, and active engagement.

KEYWORDS
Person-Centered e-Learning, experiential learning, Person-Centered Approach, Carl R. Rogers, project-based learning

1. INTRODUCTION
Last year we launched a group project in the context of a lab course in “Web Engineering” to gather further experiences with combining Person-Centered Teaching with using the Internet
(Motschnig-Pitrik, 2001, 2002). Students cooperated in small groups to solve a major, authentic project, namely to develop a web application to support them in those aspects of learning and beyond they considered important. Regarding the didactic baseline, we employed Person-Centered Teaching as developed by the well-known American psychologist Carl Rogers (Rogers, 1983; Rogers & Freiberg, 1994). Along the technical dimension we used the web-based version of the TeleWIFI e-learning platform (see Acknowledgements).

In a nutshell, the Person-Centered Approach is based on the hypothesis that students who are given the freedom to explore areas based on their personal interests, and who are accompanied in their striving for solutions by a supportive, understanding facilitator not only achieve higher academic results but also grow with respect to their personal values, such as flexibility and self-confidence (Aspy, 1972; Rogers, 1983). This approach is also known as experiential learning (Rogers, 1961). It aims at involving the whole person, his or her intellect, feelings, intuitions, meanings, goals, social skills, practical skills, involvement in learning communities, etc. Recent research and educational policy in the United States and the European Union strongly support this whole-person view on learning since it appears to be better suited to cultivate life-long learners who can more appropriately cope with the complex and unpredictable problems of today’s world. Experiential learning requires specific personal attitudes on the side of the instructor who takes over the role of a facilitator. These attitudes are highly transparent and open communication, respect towards students, and the striving for deep understanding of students (Rogers, 1961; Rogers & Freiberg, 1994).

While the benefits of the “pure” Person-Centered Approach have been proved in numerous case studies and are well documented in the literature (Aspy, 1972; Rogers, 1983; Rogers & Freiberg, 1994), its combination with elements of e-learning is a novel asset (Motschnig-Pitrik, 2002; Motschnig-Pitrik & Holzinger, 2002; Motschnig-Pitrik & Mallich, 2002). Briefly, the combination is such that major parts of the transfer of cognitive knowledge proceed via web-based services. This leaves more room for social interaction (Bruffee, 1999), knowledge construction (McConnell, 2002), and personal insights/growth in the face-to-face phases (Chase & Geldenhuys, 2001).

The next Section reviews the characteristics of Person-Centered Teaching and its enrichment by elements of e-learning. In Section 3 we discuss the concrete course design and experience in a group project on designing a prototype community web that optimally supports students in Business Informatics in their studies and related social activities. This Section includes some hints on PCeL practices and deals with students’ reactions. In the Section 4 we sketch our research strategy and point to further research and development issues. In the final Section we draw general conclusions.

2. THE PSYCHOLOGY AND TECHNOLOGY OF PERSON-CENTERED E-LEARNING

2.1 Characteristics and Goals of Person-Centered Teaching and Learning

Person-Centered Teaching can be characterized by the following goals. It aims toward:
A participatory mode in all aspects of learning and decision-making;
A climate of trust in which curiosity and the natural desire to learn can be nourished and enhanced;
Helping students to achieve results they appreciate and consider worthwhile, to build their self-esteem and confidence, while, at the same time, keeping to the curriculum;
Uncovering the excitement in self-initiated discovery, which leads students to become life-long learners;
Developing in teachers the attitudes of realness, authenticity or transparency; acceptance or respect and empathic understanding that research has shown to be most effective in facilitating learning;
Helping teachers to grow as persons finding rich satisfaction in their interactions with learners.

(Rogers, 1983, p. 3, adapted and shortened)

The Person-Centered Approach to teaching and learning is one of the derived theories of Carl Rogers’ (1902–1987) Theory of Personality and Behavior (Rogers, 1959). Rogers found that personal growth unfolds itself best if the facilitator (e.g., counselor, teacher, therapist, parent) holds three attitudinal conditions: Congruence (also called realness, genuineness, transparency, authenticity, openness), acceptance (also respect or unconditional positive regard), and empathic understanding (a deep understanding for the feelings and meaning of the respective person), and if the other person perceives them, at least to some degree (Rogers, 1959, 1961, 1995). These conditions are also called the three Rogers Variables. Although they are described separately, they depend on each other such that they “flow into a congruent whole”. Their proper combination in any situation is essential for a Person-Centered climate.

Rogers himself taught several courses at various universities in the United States and coined the term experiential-, or whole person learning to refer to the effects of his style of “teaching” which he described in several articles and one book (Rogers, 1983). Consequent research in the Person-Centered Approach proved (Aspy, 1972; Rogers & Freiberg, 1994) that students achieve superior results along with personal growth in terms of higher self-confidence, openness to experience, self-respect, and respect towards others and their environment, etc., if they learn in an atmosphere or climate that can be characterized by three basic attitudinal conditions: congruence, acceptance, and empathic understanding. These necessary and sufficient conditions must be held or lived by the instructor, better facilitator, and reciprocally need to be perceived by the students. Person-Centered courses depend not only on the instructor’s plans but, due to their participatory mode and responsibilities bear in themselves the unexpected, the chance to learn from situations in the “here and now”, and require a large amount of internal flexibility on the side of both facilitator and students. Consequently, personal and social skills as well as experience from the facilitator have significant influence on the students’ learnings. More than in any other approach the personal style of the facilitator, however, will be influential in the implementation of Person-Centered Teaching. Furthermore, in our own experience, Person-Centered Teaching requires at least a certain degree of openness of the curriculum and both willingness and time of the facilitator to offer choices and to structure the process of learning (Motschnig-Pitrik, 2001).

Below we list some of the characteristics that have proven essential in our conduct of the Person-Centered Approach. We hope they provide some inspiration, in which way so ever, to the reader.
• The teacher takes over the role of a facilitator holding the three attitudinal conditions.
• Students and faculty share the responsibility of meeting curriculum requirements.
• Students participate in all aspects of learning and decision making, for example in supplying material, tackling problems, in fine-tuning a course’s contents, learning strategies, evaluation procedures, etc.
• Students perceive authentic problems they wish to resolve personally or in small teams.
• Students are free to suggest or to choose topics, aspects, processes within the context preset by the curriculum.
• Learning takes on several dimensions. It proceeds both individually and cooperatively in small teams and in the large group, along the content- as well as the process dimension, and cognitively as well as socially and personally, intuitively or emotionally.
• Students may use the facilitator as a resource, ask for his or her experience in the field, for his or her opinion, ask him/her to lecture, etc.
• Elements of conventional teaching have their place if this is what the group decides.
• Students participate in the evaluation of learning.

2.2 PCeL: Combining Person-Centered Teaching with e-Learning and the Web

Although research has proved that Person-Centered classrooms lead to an increase in personal and social qualities and tend to improve academic achievement (Aspy, 1972; Rogers & Freiberg, 1994), they appear to be costly in terms of the facilitator’s time. The old rule: prepare once and use several times simply does not apply if students are to participate in all aspects of learning. Clearly, focusing on the needs of the individual or small group as well as on the class as a whole and, at the same time share the responsibility of meeting the requirements preset by the curriculum requires inner flexibility and, first of all, time. This means: time to think, to communicate, to structure and organize contributions, in order to make them effective for the whole group, to provide special material, and, initially, time to acquire the skills necessary to shift from being a good instructor to becoming a good facilitator of learning (Rogers, 1983). In the following let us see in which ways New Media can help in reducing some of the overhead caused by facilitating the Person-Centered style of learning.

• Provision of resources via the Internet or the e-Learning environment. Lecture notes, reading lists, links to professional web sites and project homepages can be made available electronically. Students can contribute to searching material and making it available for the whole group, optionally with comments on contents, quality, and/or availability. This saves some of the facilitator’s time for dealing with versions, organizing copies, searching material for individual purposes, and the distribution of material.
• Internet as knowledge source. Computer Science students in particular and other students in general can use the Internet for explorative, open learning (Holzinger, 2002; Issing & Klimsa, 1997). This learning paradigm is particularly suited to the Person-Centered Approach since students are free to explore the semantic web and can cooperate in fulfilling their purposes. (Note that our experience is constrained to
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working with advanced students; beginners may need some support in effectively searching the web.)

- **Course homepage.** Locality of all information regarding the course as well as the provision of organizational information on individual course units makes communication more efficient in the case that students regularly read that information.

- **Communication and participation.** The Person-Centered Approach with its orientation towards the students’ interests and participation in all aspects of learning necessitates intensive communication between all concerned (Wenger, 1998). In this respect, a learning environment provides adequate means (discussion forum, students’ workspaces, blackboards, whiteboards, etc.) to facilitate and to focus communication. Also, student tutors can help to answer and/or screen questions and help to save the facilitator’s time.

- **Evaluation.** In lab courses, continuous cooperation and web-based self- and peer-evaluation can make final tests and exams superfluous.

- **Templates and patterns for Person-Centered e-Learning elements.** We are developing web templates (Derntl, 2004b) to provide effective organizational support for patterns of typical PCeL elements (cf. Section 4). These templates are designed to aid facilitators in customizing the web support for their PCeL courses. Current web-based learning platforms neither offer adequate tools and features for PCeL elements, nor do they provide a really user-centered customization process. The web templates aim to overcome these shortcomings by visualizing and describing web support of PCeL elements from the viewpoints of all involved stakeholders (course participants, instructors, administrators).

From our experience it appears that PCeL courses still take more of the facilitator’s time than conventional ones but the overhead, in our case, is clearly outweighed by the intellectual, social, and personal gains of the respective courses. Moreover, we conjecture that increased experience with the new style will reduce some further fraction of the overhead. Unfortunately, we cannot give quantitative data on the amount of overhead in PCeL courses since we conduct most of them as case studies to which we devote more effort. However, some of the benefits of PCeL we experienced so far are the following:

- A rich choice of material can be made available to all quite easily.
- The Internet can be used for exploratory learning such that students search for material and choose and comment on resources they find most useful.
- Group workspaces for small teams can be provided such that students working in small teams can exchange and update documents independent of time and location.
- Knowledge can be constructed incrementally, both in face-to-face and online phases.
- In the case that the computer takes over essential parts of the transfer of intellectual knowledge, time can be spent to learn from the different and overlapping viewpoints of peers. Thus, social and personal learning are facilitated.
- Students who feel respected and understood tend to be more open, cooperative, constructive, acceptant and responsible themselves.
- Students can learn from multiple examples rather than just from a single one. This can be achieved if all documents delivered from students and corresponding comments from instructors and/or tutors are made publicly available in respective workspaces.
Various and individual proofs of learning are a lot more feasible. Also, mixed modes of evaluation including self-, peer-, and instructor-evaluation are quite easy to adopt.

Students who tend to be quiet and less expressive in face-to-face discussions often participate more actively in online activities that give them time to think before responding.

Students tend to be more active taking on different roles, such as document author, team mate, coordinator, enquirer, evaluator, recorder, etc.

3. COURSE DESIGN AND EXPERIENCES

3.1 The Project and the Process

The concrete, authentic problem proposed in the context of the recent advanced course on Web Engineering was to develop a prototype of a web application called WINlearn (Wirtschafts-INformatik lernen) intended to support students of Business Informatics in several aspects of learning. Our lab course project involved 26 advanced students working in 8 teams of three to four students. Quite surprisingly in this course no single student quit prematurely. Technically, we used the simple community version of the TeleWIFI e-Learning platform. From the organizational point of view, one student tutor was available in the lab for 2 hours per week. His task was to help students with technical problems and to support the facilitator (first author) regarding communication with students and platform providers.

Didactically, learning was intended to proceed on three levels: Cognitively, participants were expected to learn to collect software requirements according to various techniques and to design and implement a prototype of the WINlearn application that shall meet basic criteria of usability. Ideally, the constructors should use the resulting system to ease their further studies. Socially, students should experience the relationships between working/discussing in small groups and in the large group and should sense the difference between online and face-to-face communication. On a personal level, students should perceive their constructive capabilities while working in a supportive atmosphere where they feel received, gain self-confidence, and catch up some of the interpersonal values constituting this supportive environment.

In some more detail, the task the facilitator suggested was to cooperatively develop a prototype web application WINlearn that, from the students’ point of view would support them optimally in all aspects of their study of Business Informatics. The majority of students immediately came to support this project proposal. One team of students would have preferred a different topic, one team was quite undecided, but both joined in as they felt that following their own project proposals would give them subordinate roles in the group only. Anyway, the choice was theirs.

The course was conducted as a presence course in our lab with intense use of the e-learning platform for the provision of material and for communication purposes between the presence phases and with explicit discussions on the benefits and shortcomings of the platform during almost every course unit. The students have been advised to put all documents and presentations they prepare for the course onto the TeleWIFI platform. For this purpose, each team had its own online workspace. Although the simplicity of the TeleWIFI community
version did not allow us to protect the individual workspaces, we did not experience any single attempt to modify a team’s documents from users other than team members.

We started by collecting system requirements employing the different requirements elicitation techniques discussed in the concurrent lecture. We chose four techniques (use cases, domain analysis using class diagrams, goal analysis, and capturing of non-functional requirements) and teams were free to choose whatever technique they preferred. The following presence phases were used to present and to compare individual results, to discuss the various viewpoints and finally to consolidate the requirements and assign priorities to them. The facilitator said she wishes the teams to organize their presentations such that, over the term, there is an approximately balanced contribution of individual team members. Students willingly followed this pattern although they were occasionally weak in commenting on other teams’ contributions. However, most of the time we had real discussion on what the system should accomplish and how we should realize it.

### 3.2 Some Results

While students smoothly assigned themselves to individual tasks and succeeded in responsibly working on well defined tasks such as eliciting requirements according to a special technique, consolidating requirements with a partner team, finding out about navigation strategies and presenting this to the group, etc. putting together the results was perceived as difficult by all concerned. One problem was that students tended to upload their contributions right before the course such that often it was hard for the facilitator to plan the integration phase. This left us with the only option to deal with integration in an ad hoc way which occasionally caused confusion and was driven by the facilitator more strongly than initially intended. The consolidated list of requirements, put together by the facilitator and complemented in a successive meeting is given in Figure 1. The catalogue is given in full length since we consider the variety of issues really remarkable and hope that readers may get some inspiration from it.

Note, in particular, that WINlearn is intended to provide information about students both in a structured and free-style way (compare the topic “supply of information” in Figure 1). Thus, besides the core data and contact information, students have the opportunity to expose information about themselves, like hobbies, special interests or whatever seems important to them. Further, WINlearn shall provide a list of events and course descriptions from the students’ point of view. Some further features being remarkable since they tend not to be included in e-learning platforms are various options for initiating and supporting cooperative learning as well as selected “exchange markets”, such as ones for jobs or topics for masters’ theses. These are intended to encompass both an offer and a request view. The most important supplementary requirements concerned brief loading times (“cost-effectiveness”), transparency, up-to-date information, means like personalization to prevent one from being flooded with excessive information, and the provision of quality assurance, e.g. by providing features and algorithms for the evaluation of contributions.
Supply of information:
Collection of links to related sources and systems, Links to other universities offering courses for exchange
  - Contacts to student counselors
  - Information about students: structured and free information
  - Events, presentations, talks,
  - Descriptions of courses from the students’ point of view
Materials: (* these were allocated to be part of the e-learning platform later)
  - E-content, possibly in multi-media form,
  - Lecture notes, assignments and workouts, old tests and exams including solutions
Exchange of information:
  - Organized chats, e.g., with experts, visitors
  - Various discussions forums regarding trans-disciplinary and other topics
Markets: (Trading “Börse”)
  - Lecture notes, books
  - Jobs, student tutors, student assistants
  - Masters Theses, offers of practical work experience (“Praktika”)
Cooperative learning:
  - Students help students
  - Paid support
  - Training and preparation for exams (with staff)
  - Learning groups for exams, “Who of my buddies is online?”
Organizational issues:
  - Schedule, individual time planner
  - Alert on changes
  - Exchange programs with other universities and corresponding hints
News:
  - Changes, cancellations, happenings, other news

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<tr>
<th>Media:</th>
<th>Forum:</th>
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<tbody>
<tr>
<td>Community Rules</td>
<td>Study of Business Informatics</td>
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<tr>
<td>Community Members (data structure with fixed and variable fields)</td>
<td>News, Reports</td>
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<tr>
<td>Staff, Tutors, Students</td>
<td>Masters Theses</td>
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<tr>
<td>Hints and Frequently Asked Questions</td>
<td>1st Segment of Study</td>
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<td>Jobs</td>
<td>2nd Segment of Study</td>
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<td>Masters Theses</td>
<td>PhD Study</td>
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<td>Topics for Practical Courses</td>
<td>Baccalaureate</td>
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<td>Transition to Baccalaureate</td>
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<td>Related Issues and Enterprises</td>
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<td>Anonymous Section</td>
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Figure 1. Structured catalog of functional requirements of WINlearn.

Figure 2. WINlearn design; proposal of a general structure for the WIINF community encompassing all students of Business Informatics.
The most heated discussion aroused over the issue of the initial system’s portal, where advantages and disadvantages of data- versus function-oriented designs were exchanged. Finally, a very simple, function-oriented proposal that made it possible to subscribe to certain services won the race. As for the WINlearn prototype, we made up our minds to build it on top of TeleWIFI Communities by designing one community ("WIINF" for WirtschaftsInformatik) with general information, intended to be joined by each student of Business Informatics. Then, each course or course cluster using elements of e-learning should provide its own community. The proposals for the generic directory structures for the WIINF community and for the individual course’s communities are given in Figure 2 and Figure 3, respectively. The two levels “Media” and “Forum” stem from TeleWIFI Communities to denote areas including resources that tend to be stable versus in flux, respectively. In general, in the end of the course the WINlearn prototype system came to be less mature in terms of graphic and page design than intended but its scope and functionality by far exceeded the facilitator’s expectations.

<table>
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<th>Media:</th>
<th>Forum:</th>
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<tbody>
<tr>
<td>Persons (with links to members of the WIINF community)</td>
<td>News and Alerts</td>
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<tr>
<td>Instructors</td>
<td>Team/Student Workspace for Intermediate Documents</td>
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<tr>
<td>Tutors</td>
<td>Discussion</td>
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<td>Students</td>
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<tr>
<td>Course Description</td>
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<tr>
<td>Lecture Notes and Other Material</td>
<td>Topic n</td>
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<tr>
<td>Students’ Final Resources (organization according to topics or teams)</td>
<td>Students’ Issues</td>
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<tr>
<td>Exams-related Resources</td>
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<tr>
<td>Further Information</td>
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<tr>
<td>Hints and Frequently Asked Questions (FAQ)</td>
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</tbody>
</table>

Figure 3. WINlearn design; proposal of a core default structure for individual courses.

3.3 Students’ Reactions

Students appreciate having choices regarding the problems they are supposed to resolve. In particular, they like to tackle real problems and invest more efforts into tasks that concern them personally. For example one student writes: “I appreciate the free choice of topics. One often has an idea about what one would like to realize and being able to do this in the context of a course is great.” Nevertheless, some students prefer to acquire more consolidated knowledge they can apply as a resource in future projects. One student critically notes, “I would personally prefer more concrete task assignments. Unfortunately, too much time elapses until concrete goals can be achieved. Possibly, single (standalone) task assignments would be better than one common project.” Yet another student writes, “I found the lab course and the project work quite positive, since we were provided much freedom regarding the formulation of the task as well as the means to realize the task. The embedding of the project...
into the Unified Process Model brought about the necessary continuity.” While most students appreciate the freedom granted in PCeL courses, they still find it difficult to evaluate their achievements and learning in such a setting.

Most students finally like to work in small teams since they can complement one another. They mention that they need some time in the beginning to come to terms and share responsibilities but that working in teams, in general, is more rewarding than working on their own. “The majority of problems such as ambiguity about appointments or the fact that the task was open to multiple interpretations was resolved by communication among team members.”

Students catch up attitudes on the fly. They appear more responsible, cooperative, and even constructive in the case that they perceive being trusted and respected. A student writes in his reaction sheet, “Criticism never was de-motivating or out of place. Rather, at any point in time one had the feeling that there is the intention to be supported. Finally I’d like to express that I liked the whole environment of the course and that I’d wish to attend further courses of these instructors.” Another student mentions, “The instructor of my lab course group did a very good job, both collegially and professionally. With him I realized that he really liked working with us and had fun doing so. When I perceive something like that with a Prof., then attending the course and doing things are more motivating for me.”

Most students are quite aware of a more diffuse style of learning in Person-Centered group projects. Most of them (about 90%) appreciate this unique opportunity of social learning and acknowledge that it has a different quality to conventional learning, most probably a quality that will be more useful in their careers than fact learning. For example, one student writes, “it is positive that one learns how to coordinate work in teams. Due to the fact that similar work structures will most likely be dominant in the professional career, one gets to learn on levels other than pure subject matter.”

Students tend to prefer the Person-Centered style in the case that both, the latter and the conventional style, are explained. The facilitator asked students on completion of their introductory course on software engineering whether they would be willing to try PCeL in the coming term. All teams nodded unanimously, indicating their preference for the innovative style. Finally, all students agreed that using the Internet to support their work has been a particular benefit in the context of the course (note, however, that our students were Business Informatics students with background in computer science).

4. FURTHER RESEARCH AND DEVELOPMENT

On the basis of initial case studies such as the one described above, we are developing an extended action research strategy to deal with the design of cooperative, socio-technical systems in the context of knowledge development and learning (Motschnig-Pitrik, 2004; Motschnig-Pitrik, Dernl, & Mangler, 2004). Since we view these systems as inherently interdisciplinary and complex, Figure 4 sketches their basic components for the purpose of clarification and initial discussion. We consider it essential that the following components be co-developed in a tightly intertwined way:

- Actual conducting of courses that involve a facilitative instructor and elements of e-learning. This appears to be vital for gaining insight and experience and an estimate of the potentials of web support in authentic situations.
Modular communication and learning platform, being flexibly configurable and providing an intuitive interface to its users as well as to knowledge management tools. The platform modules we currently develop (Mangler & Derntl, 2004) to support PCeL courses are based on XML Web Services that respond to the support requirements derived from the patterns to be described next. We have learned from the case study that simple, user-oriented web support is essential. Since currently we view Web Services as the state of the art technology in the field of e-learning, we use of this technology in the implementation of web support modules for cooperation and learning (Derntl & Mangler, 2004).

Conceptual, visual models of communication, learning, and cooperation scenarios, their abstraction into patterns and their dynamic organization in a repository knowledge base (Derntl & Motschnig-Pitrik, 2004). While the use of patterns is well acknowledged in architecture (Alexander et al., 1977), software development (Gamma, Helm, Johnson, & Vlissides, 1995) and various other fields, a pattern knowledge base for blended communication and learning has not yet been realized. Currently, our pattern knowledge base holds about 50 patterns (Derntl, 2004a) that have been derived from our own experience and that are going to inform the design of other courses within and beyond the University of Vienna.

Adaptation of psychological, learning, and action theories for the purpose of blended learning in academic, scientific, industrial, and further environments for life-long learning. In this field we have experienced considerable benefits of the Person Centered Approach not only in Web Engineering as described in the case study, but also in numerous other courses such as project management or communication and new media. Both students’ reaction sheets and requirements from industry encourage further exploration and adaptation of this powerful approach in the combination with user-oriented web support.

Due to the particular personal requirements on facilitators in dealing with unforeseen situations and working with teams and groups, another essential task is the derivation and implementation of strategies for the development of facilitators, instructors, coaches.

Evaluation strategies and test instruments help one to research into the success factors and the outcome of blended learning and communication processes on the basis of the components described above. Thereby personal impressions on the quality of teaching and learning can be assessed and objectified to some degree. Here the innovative aspect lies in a thoughtful mix of qualitative and quantitative methods to be employed and supported online by platform modules.
5. CONCLUSION

The group project on designing a prototype of a web application WINlearn to support Business Informatics students in all aspects related to learning strongly confirmed our positive experiences with the Person-Centered Approach and its enrichment by the use of e-learning technology. The latter can be employed such that some of the overhead of the Person-Centered style can be reduced, in particular, if student tutors support individual communication and help in maintaining the data on the platform. A particular advantage is that students can learn not only from their own project work but equally from their peers’ contributions that are publicly available in all versions and with all comments. Although students of Business Informatics tend to prefer more sophisticated e-Learning tools they can adopt for their specific purposes, the very simple TeleWIFI Communities platform provided, in a highly time-effective way, all the support we needed to make this course a valuable (e-)learning experience for all contributors.

Moreover, the case study in Web Engineering has inspired a substantial research thread in which we have designed a developmental framework consisting of courses, course design patterns, persons, staff development strategies, theories, platform facilities, and evaluation instruments based on an extended framework of action research. Further research deals with identifying added values and finding, for each particular context, an optimal integration of e-learning elements with face-to-face sessions conducted in a growthful atmosphere. In order to further facilitate communication and organization of PCeL courses, we are mining general patterns of PCeL practices, in order to model them conceptually and support them with prefabricated web templates and cooperative Web Service modules (Derntl & Mangler, 2004;
Mangler & Derntl, 2004). Further, we aim to gain yet more experience with our style and plan further action research cycles to approach the final goal, namely to facilitate significant, self-initiated, cooperative learning in a constructive atmosphere where students and staff appreciate being life-long learners.

ACKNOWLEDGEMENTS

Thanks are due to Paul Tavolato from Mühlehner & Tavolato GmbH for providing us with the TeleWIFI Communities platform and for their constant support, and to WIFI Österreich/WIFI Netzwerk for supporting the development of the TeleWIFI system.

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