Interchanging knowledge and experiments in a learning community in a view of collaborative work

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Abstract

In this work we describe and analyze an experiment based in a programme of permanent seminars – *e*-DCET organized with the objective of developing practices of collaborative work inside the Departamento de Ciências Exactas e Tecnológicas (Universidade Aberta - Portugal), valuing the active sharing of pedagogic practices and knowledge at a variety of levels. Various themes were discussed and analyzed, among them we highlighted some experiences of online teaching in formal and non-formal contexts, user management in *Moodle* LMS, news from international e-learning meetings, visual representations and teaching chemistry online, pseudo-code as a communication language using *Notetab* and interactive materials in teaching mathematics.

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1. Introduction

In this paper we intend to highlight the need for the organic units dedicated to teaching, to create the means to develop the practice of collaborative work. We have assessed a programme of permanent seminars – *e*-DCET seminars – which took place during the 2006/07 year, and were mostly engaged in e-learning problematic. The main goals were: i) to enable the sharing of experiences; ii) to present some work proposals and results; iii) to discuss projects and ideas; iv) to present and inform about several (new) tools. Also, the general idea behind these seminars was to generate conditions to enhance work relationships and the feeling of belonging to an organic unit, which in this case, overlaps a large diversity of scientific areas: informatics and technologies, mathematics, chemistry and life and earth sciences.

This organic unit, similarly to the others departments of this, or others, Universities, characterizes for having some groups (counsels and commissions) with essentially academic and administrative functions. This organizational structure does not facilitate the creation of communities in which collaborative work between teachers should be privileged. The need to create the space and adequate moments for developing this kind of work became more important in this period of changing the curricula and teaching models in the institutions, demanding a supplementary adapting effort for teachers.

The work we describe here reports the establishment of a programme of internal seminars, which were designated *Seminários e-DCET*, from the Departamento de Ciências Exactas e Tecnológicas (DCET) (Department of Exact and Technological Sciences) from Universidade Aberta, having a set of monthly meetings, where issues related to on-line teaching and distance learning were discussed, in a collaborative work perspective. In this paper we also try to understand the importance given to the seminars by the teachers of this department, keeping in mind the initial proposed goals and themes related with e-learning that were presented.

2. Collaborative work importance in students and teachers communities

Nowadays the cooperation between individuals is more and more important in the society of knowledge and information that we live. The search, share and exchange of knowledge is vital due to it's exponential grow. This process truly depends on the interaction between peers, even though individual reflexion can be essential when learning is psychologically an idiosyncratic and personal process.

We only have to search Internet to see the importance that the so called learning constructivists environments have, which are based in an cooperative learning supported in a methodology of sharing information, objectives, feelings and cooperating attitudes among students and negotiation and sharing ideas, leading to solving disciplinary or transdisciplanary problems, that must be followed and fed by the teacher. Many educational psychologists have been calling the attention to the importance of socializing learning and incentive collaboration. We will refer to two of them, Vygotsky and Bruner.

According Vygotsky the development of the highest mental processes of an individual is based on the socialization (Discroll, 1995, cit. Moreira, 1999, p. 110). To explain the way as, in each individual, the social relationships are turned into psychological functions; Vygotsky falls back upon the central concept of mediation. The man's relationship with the world is not a direct relationship, but a mediated relationship where the symbolic systems are the intermediate elements between the subject and the world. The development grounds in the relationship man/world mediated by symbolic systems. The individual is, at the same time, active and interactive, and the knowledge built by him is based on instruments and signs that are inherent to the cultural environment. The development of the highest mental functions

includes, then, two phases: one of them is external, social, and other one is internal. In short, all the superior mental function appears twice: first, at a social, interpersonal, inter-psychological level, and later at an individual intrapersonal, intra-psychological level. The transformation of an interpersonal process into an intrapersonal level is the result of a long series of events happened along the development (Vygotsky, 1998, p. 75, 1991, p. 46).

When we intend to define the relationship that effectively happens between the process of an individual's development and the potential capacity of learning he has, we cannot bind at an only one development level. We should consider a level of effective, real development, the one that correspond to his psycho-intellectuals functions that resulted of an accomplished process of cognitive development and that is determined by the effective development tests and/or by the problems solving in an independent way, but we have also to have in account another development level, the potential development level, determined through the resolution of problems under the orientation of another people interacting with him. Therefore, according to Vygotsky, there is a zone or area of potential development, also called of proximal development area that corresponds to the distance between the level of real development and the level of potential development. The good teaching is based on a good social interaction among students, in an adequate environment to a fruitful cooperative work, where each student is dominating more and more the tools and signs' system necessary to regulate himself in the social relationships, with the teacher and more developed colleagues' aids. This accelerates progressively the development of each student.

Unlike what is defended by other psychologists, Vygotsky considers that there is a reciprocal, extremely complex and dynamic dependence, between the development process and the learning process (Vygotsky, 1991). Existing a second level of the students' development, the potential development, it is necessary to explore the zone of proximal development. Then, if the teaching is oriented by the actual level of the student's development it is ineffective under the point of view of the general development, as it is limited to follow that development and it doesn't drive it. As a matter of fact, Vygotsky adopted a principle that, according to him and who follow him, contradicts exactly the traditional and facilitator orientation: " The good teaching is the only one that goes ahead to the development " (Vygotsky, 1991, p. 46). Thus, the teaching should be planned to place some permanent challenges to each student's capacities and to stimulate him to cooperate with other students in the sense of surpassing those challenges.

Another important educational psychologist whose ideas also point to the psychological foundation of the cooperative learning is Jerome Bruner (2000). According to him, what is fundamental to teach with quality any subject to a student in any development level is to keep in mind, among other factors, the " subject structure " to teach, that is, the fundamental ideas and the relationships between them and a " reference picture ", to make the details on the subject more comprehensible. This determines the way as the subject should be approached.. Another idea of Bruner that points in the direction of collaborative processes in teaching is the construction of school cultures that operate as students' communities. In such school cultures, to be good in some aspect implies, among other things, to help the other ones to be better in that same aspect. Several investigators have been developing works in the field of the cooperative learning. That is the case, for example, of the siblings David and Roger Johnson, of the Minnesota University, Robert Slavin, of the John Hopkins University, Spencer Kagan, of the California University, Elisabeth Cohen of the Stanford University and Shlomo Sharan of the Tel-Aviv University.

Several studies, such as the ones of Humphreys, Johnson & Johnson (1982), with Science students, of Sherman & Thomas (1986), with High School Mathematics students, of Johnson & Ahlgren (1976), Humphreys, Jonhson & Johnson (1982), Tjosvold, Marine & Johnson (1977) and Wodarsky et al. (1980, cit. Abu & Flowers, 1997) concerning the attitudes of the students about learning, and others (Slavin, 1983), pointed to the following positive effects of

the cooperative work strategies:

- an improvement in the interpersonal relationships;
- the promotion of more positive attitudes in relation to teaching, disciplines, teachers, etc.;
- a greater intrinsic motivation for the search of the necessary information;
- a greater capacity to communicate, to negotiate, to coordinate and to share information;
- less problems of behavior:
- a less tendency for the absence to the classes;
- the acquisition of socially important competences, as, for example, of communicating and of critical thought;
- an improvement in equally important attitudes and values, as, for instance, the respect for the other people;
- an improvement in the learning attainment.

Transposing the previously referred aspects for a community of teachers, we should highlight that the collaborative work demands that the involved individuals domain some social capacities. As each individual's knowledge is based on the experience he has and, therefore, is a personal cognitive process, such a process interferes in the complexity of the relationship of the subject with the environment, that is to say: the whole knowledge is a socially mediated process. There is not any individual development without the intervention of the environment and of the instruments of social mediation. Therefore, the knowledge, the experience and the interaction are tied up intrinsically linked, they do not exist independently, they are mutually constituted. The quality of the interaction of the teacher with the environment and, in particular, with his/her colleagues during the collaboration is absolutely fundamental for the development and the knowledge construction. It was the process of science construction, in "synchronous" or "asynchronous" interactions among scientists. On the other hand, the collaborative work communities demands the creation in the groups of : i) relationships of positive interdependence, which should create the sensation of group successful or unsuccessful;, ii) a sense of common responsibility, iii) constructive, reflexive and evaluative interactions, that contribute effectively to the improvement of the group function.

Table I – Differences between groups of cooperative work and traditional work (from Johnson & Johnson, 1989).

Groups of cooperative work	Groups of traditional work
Positive interdependence	There is not interdependence or there is negative interdependence
Individual rresponsibility	There is not individual responsibility
Look for the heterogeneity	Look for the homogeneity
Shared leadership	Without leadership or with a nominated leader
Mutual shared responsibility	There is not mutual shared responsibility
Preoccupation with the knowledge and competences acquisition of the other group members	There is not preoccupation with the knowledge and competences acquisition of the other group members
Emphasis in the work and in the sustainability	Emphasis in the work

Direct teaching of social «skills»	It is assumed the previous existence of social skills.
Teacher observes and make interventions	Teacher ignores the group function
The group monitors the productivity	The group do not monitor the productivity

At present there is a great challenge made to teachers to emerge constructivists virtual environments of truly cooperative learning. This goes through the exploration the powerful technologies that we currently have, and by a great pedagogical know how, which able to go from an essentially linear and direct teaching to a non-linear and interactive, perfectly adequate to the currently constructivist paradigm. This way Distance Learning will step forward towards an excellent and needed life continuous learning based on a collective knowledge construction and in collaborative learning networks (Schrum, 1998, cit. Okada, s/d). This way, we consider that to create learning collaborative virtual spaces, some important conditions must be highlighted (Britain and Líber, 1999):

i) existence of conditions that able the students to auto-organize for sharing information, experiences and ideas. It is possible today to create such conditions with the learning platforms; however it is fundamental that the teacher makes the cooperation easy playing correctly his pedagogical role.

ii) the teacher must use these spaces from the beginning, and be explicit and clear, but not inflexible regarding the competences that must be developed, permitting the students to reflect and share their personal expectations with the course, why they did enrol in it and their previous knowledge limitations. With an optimistic speech trying to clear away the "ghosts" of difficulties, errors and limitations, the idea is to create an ambient of mutual help. This is designated as positive interdependency.

iii) Beyond this it is very important that the teacher while being a mediator help his students to overcome *technofobia* and fear from ICT's;

iv) Pedagogical mediation from the teacher must be supported, systematic and pedagogically and technically adapted to each case. In distance learning the adaptation depends on synchronous and asynchronous communication tools. All technological potentialities must be pedagogically explored.

v) A good learning also goes through coordination which means that must boost working groups, creating challenges, putting materials to be worked and suggestions for making searches and activities, establishing schedules, reminding students the objectives of the curricular unit. Each student must also be able to have autonomy, reflect on what he has learned and yet to learn, expose his own difficulties, analyse how he can contribute more and better to his own learning and his colleagues.

vi) The teacher at the presential teaching is present and visible to students, interacting with them each day. However the distance learning teacher could be dangerously hiding himself due to his physical distance from students. It is therefore important to have three aspects: cognitive, social and teacher presence (Garrison & Anderson, 2005).

vii) The monitoring of the teaching process is also important; To monitor means to follow the learning process step by step, analysing the way groups are working checking if students are achieving the objectives, deciding how to help them to keep going, establishing pausing periods for reflection, helping to overcome conceptual and psychological difficulties. For this, the teacher must have a good knowledge about evaluation.

With these seminars we tried to create favourable conditions for collaborating work among teachers so they could use the methodologies in their own curricular units.

3. Presentation and Description of *Seminários e-DCET*

The *Seminários e-DCET* were proposed and presented during the year 2006/07 and their main objectives were: i) to share experiences; ii) to promote work proposals and their results; iii) to discuss projects; iv) to inform about new tools. This way we intended to create new spaces and moments for sharing knowledge and to acquire the needed skills for teaching in a virtual class. During the period in which these seminars took place some adjustments were made due to the growing pertinence of some themes among academic community. Table II presents the themes discussed and their objectives.

The seminars took place between January and June and had an average participation of 15 people per session. The information concerning the seminar program and the materials delivery was made through the department web page using *Moodle*. It is important to mention that a logo, created by one of the department colleagues, was used as an identifying element of the *Seminários e-DCET*.

Table II – Themes presented and objectives.

Theme	Objectives
Experiences in using the Moodle platform in Software Engineering curricular unit.	To allow the share of experiences.
e-learning and on-line professional training – security, higiene and health at work	Disclosing of working proposals and results
News from Educa Berlim 06	To report about new tools
Reporting an experience of using learning contracts in a pos-graduation curricular unit in the Environment field – highlighing evaluation	To share experiences
New features in Moodle	To report about new tools
Visual representations and teaching chemistry online	To report about new tools
Pseudocode as a communication language using Notetab	To report about new tools
Interactive materials in teaching mathematics	To report about new tools

Following is a brief description and characterization of each theme presented, highlighting the objectives for each one:

a) Experiences in using the Moodle platform in Software Engineering curricular unit.

In this presentation was described an experience in a course ("Engenharia de Software" - Software Engineering) in which the teaching paradigm was changed from tradicional distance learning to online model. We first used the *Intralearn* platform and then we changed to the Moodle platform. In this presentation were described the materials to be used and the types of interactions that were available in each plataform. During the presentation were presented

several slides showing the usage of the materials and the frequency of interaction that occurred in those sessions. It was verified that increasing interaction resulted in an increase of usage of materials and the number of successes in the respective course

b) e-learning and professional training – security, hygiene and health at work

The goal of this presentation was to share the know how and to show a b-learning project from Universidade Aberta, developed for a non-traditional public of this University, and to show that this training can assume an important role on workers qualification that spend most of the time working outside in the fields. This course was totally on-line supported in an *Intralearn* platform (LMS) and a set of materials specially developed for it and took place between February and July 2006.

The main objective was to give professional training in the area of security and risk prevention at work and was part of a larger project designated by OGREASA (Organization and Management of Spaces and Activities from the Agriculture Sector). The main objectives of this project, supported by the EQUAL European Program, was to contribute for the adoption of correct attitudes and behaviour development which are safe and adequate to the specificity of this working environment, in order to effectively prevent work accidents and professional diseases. The main objectives of this course inside Universidade Aberta, were:
- to call the attention of professionals for the economic and social importance in preventing risks at agriculture activities;
- awareness for the social and human need and economic advantages, with the improvement of the working conditions;
- propitiate, to the participants of the course, the knowledge about general and specific matters that can able them to promote attitudes among other people that work in the farms concerning the security, hygiene and health in the work and to help to make a better choice in security and prevention devices that help to reduce professional risks;
- and finally to sensitize the participants for the need to promote genre equality and equal working opportunities at their professional and personal lives (one of the objectives of EQUAL European Program).

c) News from e-Educa Berlim 2006

Generally based on the concept of ICT for development, on-line Educa Berlin 2006 agenda is packed with topics that are currently key discussion points for e-learning. The four main issues through the point of view of Universidade Aberta, as recommendations to be observed and discussed for e-learning development, as implementation process within organizations for specific procedures to learn through simulation actions as also wider interlaced life-long learning communities, are presented:

i) Universities and ICT:
-Strengthening links between universities and industry.
-The effect of Technology Enhanced Learning (TeL) on traditional educational research, including the changing role of journals, and the promotion of educational research that investigates ICT-supported innovation.
-Leadership and e-learning as components of the wider student experience.
-Flexibility and meeting the needs of students, wherever and whoever they may be.
-Change management and issues related to the deployment of e-learning: funding models, dealing with staff change and *up-skilling*.
-Integrating of e-learning within institution-wide strategic ICT supported initiatives like e-administration, e-research and digital libraries.
-Personalised learning and competence management.

ii) Designing Effective Online Learning and Quality Standards:
-Setting up and maintaining collaborative learning environments.
-Standards and standardisation linked to open and interoperable systems and services
-Creative pedagogical approaches, building effective learning frameworks and architectures.
-Flexibility in instructional design related to teaching and learning models that deliver positive results.
-Approaches to quality assurance in e-learning, quality frameworks and permanent feed-back measurements of quality according the needs of the learning community.
-Digital content creation and ownership Intellectual Property Rights garentee for building online resources, portals and content repositories.
-Sectorial, regional, national and European collaborative initiatives aimed at enhancing the quality of e-learning.

iii) Emerging Tools and Community-Based Services:
-New forms of learning making use of the latest technological developments including virtual and augmented reality features to community-based services such as wikis, blogs and blikis.
-Podcasting and the learning opportunities offered by this and other developments in the infotainment world.
-Innovative experiences with enabling devices, systems and services based on mobile, wireless and wearable technologies, virtual environments and systems supporting ambient or contextual learning.
-Innovative applications of grid computing, as well as advances in tele-presence, streaming, collaborative and conferencing technologies.
-Impact of interactive and digital TV (including mobile TV).

iv) Universities may held collaboration as Lifelong and Informal Learning, Inclusivity and ICT in Schools:
-Encouraging, promoting and developing lifelong learning and the role of digital technologies.
-Informal learning as part of on-the-job learning and participation in working life generally.
-Lifelong professional development and the links between universities and industry.
-Measuring, accrediting, and rewarding informal learning.
-The importance of e-competences for life and employment.
-Gathering inclusively promotion, the use of information and communication technologies for capacity-building as diversity training and e-learning to support a policy of inclusion.
-Finding the right tools and environment to enable real learning in schools and redesigning learning environments for the Net Generation.
-Curriculum development aimed at supporting digital creativity and successful programmes integrating ICT in schools
-Blended learning that meets the challenges of bringing online learning into school environments.
-In-service and pre-service teacher training: developing digital teachers who are as much at home with technology as their students.
-ICT-supported initiatives aimed at promoting student collaboration across borders and generations.
-The role of search engines in school education; security and safer Internet initiatives.

d) *Reporting an experience of using learning contracts in a pos-graduation curricular unit in the Environment field – highlighting evaluation thematic*

This presentation described the way the curricular unit Biodiversidade, Geodiversidade and Conservação (Biodiversity, Geodiversity and Conservation) was organized, highlighting the materials used, the way they were made available, the proposed activities and its schedule. All these elements are part of a document that is initially delivered to the students and is designated Contrato de Aprendizagem (Learning Contract) (Pereira *et al.*, Modelo

Pedagógico da Universidade Aberta, Universidade Aberta, 2007). It was also emphasised the didactic importance that one can have in certain scientific areas by having and maintaining, by the students, thematic *blogs*, in which assuming individually or collectively, reasoned positions, in a participative citizenship are skills to develop.

In association with the previous theme there were discussed. i) evaluation paradigms; ii) historical evolution of the evaluation concept; iii) didactic functions of evaluation; iv) evaluation as a constructive process; v) evaluation; vi) the self-evaluation role and peer evaluation; vii) which evaluation to adopt? viii) which parameters to evaluate; ix) which evaluation criteria should we adopt?

***e)** New features in Moodle*

This session aimed at discussing some of the features of the *Moodle* Learning Management System (LMS), regarding the management of users (students and tutors) in the new pedagogical model adopted by Universidade Aberta.

One of the features discussed, meta-courses, allows the management of user enrolment in courses and in associated spaces in the LMS. A meta-course is simply a course that inherits the list of user enrolments from other courses. Two models were presented (cf. http://docs.moodle.org/en/Metacourses): one where a meta-course represents a degree that inherits enrolments from all courses in that degree; and another where meta-courses inherit user enrolments from a *Moodle* course representing the degree. The first one assumes that all students in the component courses are in the same degree, the other one assumes that all students in a degree attend the same courses.

Another discussed feature was that of groups. In a *Moodle* course, groups of students may be created without constraints: i.e., any student may belong to zero or more groups, and any group may include zero or more students. The whole course or merely some activities may be configured to work with groups.

The final discussed feature, roles and permissions, is new to version 1.7 and allows teachers to fine-tune capabilities of users in their courses. Any user has a role (student, teacher, and administrator) in a given context, with a set of administrator-defined permissions. Those permissions can be overridden by teachers in their courses, so that students can perform tasks that they were not allowed to, initially. Conversely, this mechanism enables teachers to deny specific students access to parts of the course.

To conclude the session, the limitations of these features, when applied to our reality, were pointed out. The assumptions of both meta-course models are not verified in reality: obviously, students in a degree are not always attending the same courses, and there are also courses that are used in more than one degree.

The groups feature is generally useful (and it is used in the new pedagogical model), but the created groups are global to a course, that is, all activities, if configured to work with groups, have to use the same groups. This feature is being improved in version 1.9. Roles and permissions is the most flexible and powerful of the new features. However, it is difficult for less experienced users.

***f)** Visual representations and teaching chemistry on-line*

Bearing in mind the new challenges for Universidade Aberta, which is adopting a new Pedagogical Model the main goals of this module were to share some know-how in creating video for on-line use. This way it was simultaneously shown how to:
(a) create 3D representations, which can help the student to better understand several

issues, like those in chemistry, which may go from atomic orbital to polymeric structures;
(b) create movie files, starting from these representations or from several different other sources, useful to better illustrate the discussion topics, over the Internet in a virtual classroom.
(c) make on-line assessments of the final work produced and delivered to a site at the Internet.
This presentation made use of free and other common software in order to show that it is possible to make this kind of work without spending too much effort or money.

g) Pseudocode as a language of communication, using Notetab

Software development is a difficult subject to learn for many students. One important component of software development is the design phase. In the design phase the solution of the problem - the algorithm - is written in a language known as pseudo-code. Pseudo-code is just plain text with some structure added to it by means of constructs such as if-then-else blocks. Algorithms at this stage resemble code but are written more freely as structured text.

Any ASCII text editor that is currently available in the market, can be used to write pseudo-code but few are that can aid in structuring it in a consistent and proper manner. *Notetab* is one of these tools. The pseudo-code constructs, such as the if-then-else blocks, can be coded into macros and added to the *Notetab* editor as a library of clips known as a clipbook. Clips are macros, written in a very simple script language that can be used to perform a wide range of functions, from simple text substitutions to mini-applications that uses other clips.

The language presented at this seminar uses clipbooks to write algorithms in pseudo-code. This type of structural writing is made using templates and place-holders. The templates define the various forms in which the elements can be presented (indented, grouped, in-line, etc.) and the place-holders, the places where they should appear in the text. Every element has a template or is part of one. Templates are loaded through clips and placed where the cursor is located. The place-holders indicate the positions where the cursor should be placed before loading a template or writing data. Data can be entered through dialog windows or typed directly.

The *Notetab* allows for these contents to be converted to other formats (for instance, html), sent to any browser (*IE* or *Firefox*) or e-mailed to another user. *Notetab* allows also for tools such as the TexAide (a math editor) to be integrated. All this accomplished by means of clipbooks. As text resources, these contents can be made available to platforms of e-learning, such as *Moodle*.

h) Interactive materials in the teaching of Mathematics

In the communication "Interactive materials in the teaching of Mathematics" a number of examples of internet sites was presented, covering a large spectrum of ideas of how to use the potentialities of online software applications in the teaching of Mathematics at the undergraduate level.
The talk consisted in a guided tour to a number of sites with illustrative applets for practice of a variety of mathematical topics, of online classes, automated assessment, among other topics. The importance of this type of devices in the learning and assessment processes was stressed.

4. Assessment of *seminários e-DCET*

Having the purpose to assess the interest that *seminários e-DCET* had in the teachers as well as to observe if the goals initially stated were achieved we have prepared an on-line test through the DCET intranet, using Moodle, which was divided in two parts: the first one had a

general character and in the second we asked for an appreciation about each one of the workshops. In a total of 14 they are from teachers that did participate in the seminars although this does not correspond to everyone that was present.

Regarding the participation frequency in the seminars we can see that there was a significant group who followed the seminars in a regularly (Table III).

Table III – Participation in *seminários e-DCET*.

Session number	Number of times attended by the same teacher
1	1
2	2
3	1
4	4
5	6

When questioned about what are the objectives that they considered to be achieved there was almost an unanimity reference to sharing experiences and disclosing of new tools (Table IV). These results are seen not only as tendency indicators but also show the need to reformulate objectives to better define their application scope.

Table IV – Achieved proposed objectives.

Objectives	Number of times mentioned
a) Allow experience sharing	12
b) Promote new work proposals and results	3
c) Discussion of projects	1
d) Inform about new tools	11

When asked about the need to propose new objectives in a future edition of theses seminars, some considered they should be kept although it should be desirable to develop more the work done. Others noted yet:

i) the importance of discuss the options that were taken in the conception of their curricular units, integrating them with the new pedagogical model at Universidade Aberta. Regarding this last issue, topics like the construction and presentation of the didactic materials, implementation of on-line learning spaces to encourage significant learning and discussion of the problems related to the implementation of formative evaluation, were referred;
ii) the technical exploration of the Moodle platform resources, through the knowledge and skill of new tools;

It was also asked to indicate, in a 1 to 5 scale, the self interest in each theme presented (Table V).

Table V - Interest in each theme.

Theme	Interest (the values are the sum of the given classification)
Experiences in using the Moodle platform in Software Engineering curricular unit.	46
e-learning and professional training – security, higiene and health at work	40
News from *Educa Berlim 06*	29
Reporting an experience of using learning contracts in a pos-graduation curricular unit in the Environment field – highlighting evaluation	42
New features in *Moodle*	32
Visual representations and teaching chemistry online	40
Pseudocode as a communication language using *Notetab*	28
Interactive materials in teaching mathematics	40

The interpretation of these results must take into account the fact that the seminars did not have high frequency levels which affects the results. Also, it must be said that some of the authors responsible for a presentation did not attribute any self classification.

It should be noted the apparent discrepancy among the proposals referring the importance of the technical knowledge of the *Moodle* platform and the lower interest indicated to these themes.

5. Final considerations

The main question discussed in the meetings among teachers from DCET, when the e-DCET seminars were proposed at the beginning of the year 2006/07 and later at the end of this programme, was the fact of these seminars were not open to the rest of the University community. The arguments, by one side, claimed the need to increment the spirit of internal cooperation and knowledge and experience sharing among teachers of this department, in an informal environment, and by the other side the importance that this could bring to the department and even the institution by opening them to the rest of the academic community. The importance given to collaborative work and the understanding of this concept during the seminars was in the centre of this discussion. This justifies the importance given to the inquiry to indicate the orientation guide lines for a future reformulation of the project.

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