Good practices for the development of Open Virtual Learning Communities

Ορθές πρακτικές για την ανάπτυξη Ανοικτών Δυνητικών Κοινοτήτων Μάθησης

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Περίληψη

Το άρθρο παρουσιάζει τον τρόπο με τον οποίο οι Δυνητικές Κοινότητες μπορούν να εξυπηρετήσουν τις ανάγκες καθενός για Εκπαίδευση και Κατάρτιση. Η φύση των δυνητικών κοινοτήτων επιτρέπει στον καθένα να ενταχθεί σε αυτές διαθέτοντας μικρή προσπάθεια και πόρους και να υποστηριχθεί σε όλη την μαθησιακή διαδικασία. Οι δυνητικές μαθησιακές κοινότητες αποτελούν μια τάση προς την κατεύθυνση της ανοικτής μάθησης από απόσταση και παρέχουν νέους, ευέλικτούς και πολλά υποσχόμενους τρόπους εκπαίδευσης, κατάρτισης, επικοινωνίας και συνεργασίας μεταξύ των μελών. Είναι ανεξάρτητες από γεωγραφικούς και χρονικούς περιορισμούς. Μια δυνητική μαθησιακή κοινότητα πρέπει να σχεδιαστεί προσεκτικά ώστε να καλύπτει τις ανάγκες των μελών της και να εκμεταλλευτεί τη συνεισφορά τους όσο το δυνατόν περισσότερο. Το άρθρο ξεκινά διασαφηνίζοντας τις σχετικές έννοιες και καταγράφοντας τις ανάγκες για ανοικτή εκπαίδευση. Στη συνέχεια παρουσιάζεται ένα πλάνο δράσης για την ανάπτυξη ενός ανοικτού εκπαιδευτικού περιβάλλοντος στα πλαίσια μιας δυνητικής κοινότητας. Εστιάζουμε στα κρίσιμα σημεία της εγκαθίδρυσης και διαχείρισης μιας ανοικτής μαθησιακής κοινότητας και συζητούμε τους παράγοντες επιτυχίας, τα πλεονεκτήματα και μειονεκτήματα τις προσπάθειας.

Abstract

This paper presents how Virtual Communities can fit the needs for Education and Training for everyone. The nature of Virtual Communities allows individuals to join with minimum effort and resources and be supported throughout the learning process. Virtual Learning Communities is a trend in open and distance learning, which provides new, flexible and promising ways of education, training, communication and collaboration among members, independent from any geographic and time restrictions. A virtual learning community must be carefully designed to cover the needs of its members and to exploit their contribution as much as possible. Several dangers are hidden when a virtual learning community gets open to the public. After the relative concepts are clarified, and a first recording of the needs of open education is performed, we present a plan of action for the development of an open educational environment. We focus on the critical issues of building and managing an open learning community and discuss some good practices that should be followed. Finally, we discuss on the factors of success, the advantages and disadvantages of this undertaking.

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1   INTRODUCTION

The need for continuous, effective and qualitative education and training is exigent, due to continuous growth of information, rapid changes in technology, the demand for high degree of specialisation, and increased productivity. **The role of education in active sectors** is very difficult. The increasing needs for expertise, the inflation of existing knowledge and the limited time that engineers have for education and self improvement create the need for delivering the appropriate knowledge to the appropriate people in the minimum of time. Even open educational programs are insufficient to adapt and cover all emerging needs. The only viable solution seems to be education on demand. Previous works in running "life-long learning" programs inside Virtual Learning Communities have sporadic results and have no predefined implementation path. Virtual learning communities' intent is to create a learning environment where individuals meet, communicate, jointly confront emerging problems, obtain and produce knowledge. The methodology for developing and supporting communities is presented in this paper. Since the merits of virtual learning communities in education and life-long learning have been discussed in related bibliography [1], [2], [3], this article moves one step towards the implementation of such a community by presenting the design issues of the VLC and the sequence of actions to be taken for the development of a VLC. In the following section, we provide some recent actions related to Virtual Communities in Education and Training. Section 3 describes the overall development process whereas section 4 focuses on the post delivery phase, when the community is "Up and Running". Section 5 presents typical examples from the use of virtual community for education. In section 6, we present the conclusions of our approach.

2   RELATED WORK

A virtual community [4], [5], refers to a group of people (and the social structure that they create), founded on ICT technologies aiming at collectively conducting activities related to training or education, i.e. actual delivery of educational content, education and support of community members', discussion and collaboration is problem solving etc. The stakeholders and participants comprises educational institutes, professional organizations, individuals educators, trainers and educatees.
Virtual learning communities are emerging everyday in many domains. All these communities functioning today can be divides in 2 types of communities, classified by the intended members. Virtual training communities or communities of practice, in which professionals of different disciplines combine their knowledge and expertise to provide comprehensive solutions to every day problems related to their work. Examples are the VirRAD [6] project for Healthcare professionals, the American Health Information Management Association - AHIMA [7] from the healthcare domain. On the other side Virtual educational communities supported mainly by Universities and educational organizations assemble educational modules into targeted programs and guide students and trainees to improve skills. They undertake the administration of the community and in parallel monitor and facilitate members. They provide primary, secondary or life long education, covering a wide range of ages and comprising all official, unofficial and informal learning methods [8].

In the era of **open and life long learning education** all learning tools and materials are available to the student the syllabus, tasks and targets of a program are loosely defined and can be modified at students' will. The idea of 'open' is tightly related to virtual communities, since anyone interested in education is a potential member for an

learning community, and is likely to communicate his/her opinion to other community members. In open and virtual learning communities, autonomy is favoured. Moreover, students' needs and capabilities affect the structure, duration and tempo of an educational program. Open education can be delivered from distance or not, is delivered to groups or single students and allows students to interact with the programs' structure [9], [13].

3   DEVELOPMENT PROCESS

In order to achieve successful introduction of the VLC in a specific domain of population and receive best acceptance from potential participants we need an Action plan [10]. The plan should be elaborated by the Ministry of Education in collaboration with other institutions and universities. During its development, the proposed step sequence, as shown in Figure 1 and analyzed below, might be used:

Figure 1: Steps for the development of virtual learning community
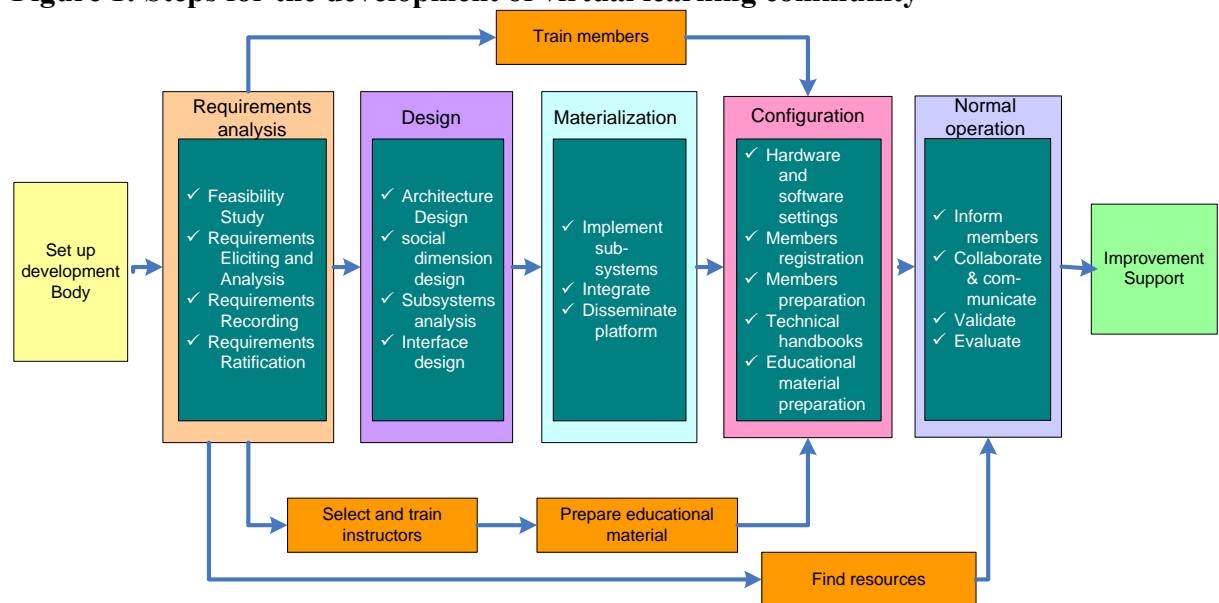
### 3.1   Establishment of Development Body

The Virtual Community Development Body is responsible for the supervision of the strategic Action Plan and for the realization and proper function of the platform. Its members will comprise Ministry executives, scientists (with educational and informatics expertise) and esteemed representatives of the various categories of participants. The formulation of working groups will increase flexibility. The organization that will undertake the development of the information system must be selected in this preparative step.

3.2   Requirements Analysis

This step comprises many substeps. *Feasibility Study* includes the determination of general principles and functions of VLC. In this sub step, issues related to the three dimensions of a VLC, as it appears in figure 2 - *technological, educational* and *social* - should be considered. The *technological dimension* is related to required technological infrastructure, the software and the tools that will be used for the realization of the platform, the used standards, the functions which it will comprise but also the general pattern and aesthetics of virtual training environment (interface). During the design of *educational dimension* of VLC, subjects are supposed to be

taken into consideration such as: the new pedagogic theories and models to be used, the way of tele-education (asynchronous or modern), the instructors' selection, the educational tools to be used (courses in virtual classes, educational software, simulations, etc), the selection of digital educational material and its form, etc. Finally *social dimension* will refer to subjects deriving from the fact of a community existence, as e.g. the access right in the community, the policy of new members' acceptance, various roles to be assigned to the members, the rights and the obligations that result from them, the intellectual property, the behaviour codes and rules, etc.

Figure 2: The three aspects of a community
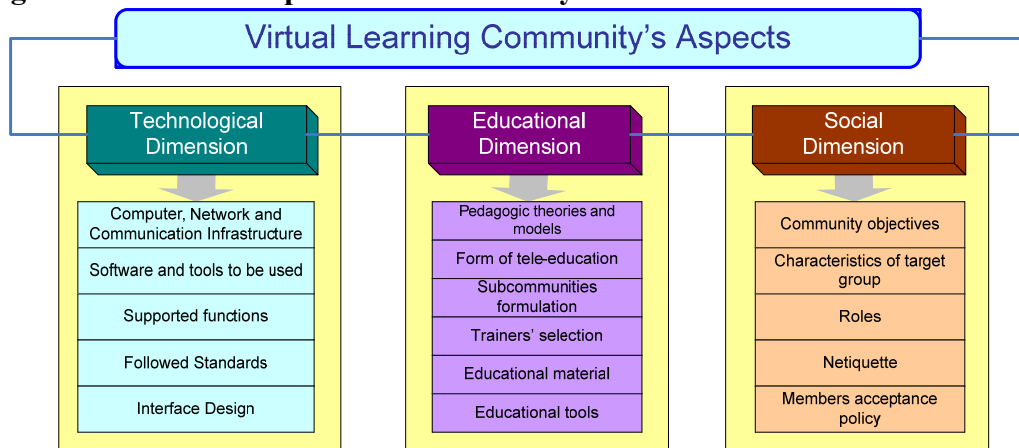
Requirements Recording requires field research and requirement collection methods (questionnaires, interviews, Hard Data Capture) in order to identify human educational and informative needs and their familiarization with the new ICT technologies. *Users' Requirements Elicitation and Analysis* demands that requirements will be processed and the existing computer and telecommunications infrastructures will be tested, in order to locate possible improvements and extensions. In *Requirements Ratification* process, decisions concerning the platform, tools and models are finalized. Functional, performance, documentation requirements and timetable are posed to the software company. The imposition of quality specifications and standards (e.g. ISO standards) are significant, in order to be ensured the product has high the necessary quality and reliability and it is appropriate for use. An existing platform, for example moodle (www.moodle.com) can be used as a prototype community, in order to collect, specify and validate requirements. The Development Body, will determine the services to be be offered by the community (*Educational, Communication and supporting*)**,** the advantages and disadvantages, the costs and merits.

3.3   *Community Design*

It is based on Requirements Analysis and realised in collaboration with the software company that will undertake the development. It comprises *Architecture Selection*, that is the technical environment in which the community will be realized, the required for development hardware and software, data structure, and the definition of the real place the platform will be situated, etc.) and *subsystems analysis* according to supported functions. In this stage, issues related to sociability and usability should be taken into account [11], [12]. Sociability refers to the collective purpose of a community, the goals and roles of its members, and policies and rules defined to foster social interaction. Usability implies that the VLC should be designed in a way, where members will be able to communicate with each other, find information, and

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navigate the community software with ease. Also actions for ensuring members' identity recognition, in order deception to be avoided [2], as well as for providing privacy and confidentiality should be undertaken.

4 Community Realization

The specified subsystems are materialised and tested, and their integration in a single platform takes place in this phase. The quality of the delivered products is checked against initial requirements. In this stage, potential members get informed on the existence of the new community, in order to join. In parallel, the development team works on the preparation of human resources (training courses regarding new ITC technologies and tele-education methods, in order digital divide to be eliminated), the selection and training of instructors (in pedagogic and tele-education methods) and the selection and preparation of educational material.

The educational material must be digitized in a form that facilitates distribution and reusability among community members. Multimedia files, organised as Learning Objects, are the ideal solution. Instructors will prepare the required Learning Objects, which after revision and approval by the Scientific Council of the community (approved executives and scientists of the domain of expertise especially selected for this aim by the Development Body of community) will be available to community members.

4.1 Initial operation and ratification of platform

The hardware and software are configured to guarantee the smooth operation of the community. Members register into the community and get access rights into the Knowledge Base. This is the kick off point for the community. Ratification and control subsystems and the integrated platform are performed in a continuous manner so that the community operates without interrupt. Members receive their credentials and are accredited their roles. User manuals inform members on the functionalities of the community, on their rights and responsibilities. The dissemination of the community attempt among citizens is performed via Press and Media.

4.2 Normal Operational of the community

This phase includes supportive actions. Trainees participate in telecourses inside virtual classrooms, download recorded courses, chat and exchange e-mails and collaborate to carry out assignments, search for material etc. Instructors prepare their tele-courses and digital educational material to be put in the community, while at the same time they answer in queries. Specialised and well-known members of scientific field are invited to give virtual lectures from wherever they are situated. Citizens make queries and receive scientifically validated answers. At the some time, community's performance evaluation is conducted by the Development Body and the participants, so that several useful conclusions on its strong and weak points to be extracted.

4.3 Improvement & Maintenance Step

In this stage solutions and improvements for the emerged problems during the performance of Community but also essential modifications for the environment to be more functional and user friendly are proposed and materialised.

5 USE CASES

Virtual learning communities can be used for both theoretical and practical cognitive objects teaching. For a theoretical object, targeting professionals' or students' fundamental educational needs, asynchronous educational manner is selected and the educational procedure will be performed generally as described below.

Course material is made available to the specific sub community. Potential students apply for the program and consequently register. When the course is ready to start, a reminder is send to all participants. Instructors create and upload educational units and exercises regularly, answer to queries via e-mail and chat during their "Office Hours" with trainees. Trainees form "informal" work groups in order to study, search in Community's Knowledge Base and in the World Wide Web for additional educational material, and collaborate for the exercises. Instructors receive exercises by e-mail and reply with comments and marks. Trainees may send comments on the course or educational procedure, or discuss about them in specialized discussion groups of their sub community. The students' exams are performed online and along with quantitative and qualitative (active or passive attendance) criteria evaluate students. Possible problems are identified and recorded at every step, and the necessary actions are taken by the Community operators.

Educational procedure of a practical object, e.g. a software programme targeting the medical personnel will be carried in a synchronous education matter and the procedure is as described below. Educational material on "task management" is put on the community site and the Community members are informed to browse and register for the program. Virtual classes are performed using presentations, examples on a virtual blackboard, etc. and questions are answered. At the end of each class, a small exercise is delivered in order to be elaborated up to next course, so trainees practise and motivate themselves. Additional queries are answered via discussion groups. Trainees create "informal" work groups, exchange additional educational material and already existing files of this program, and work on small projects. Assignments are evaluated and commented and some of them are made available as paradigms to other trainees. Overall conclusions on the course are processed by instructors for the re-designing of program.

6 CONCLUSIONS

Virtual learning communities offer a flexible, attractive and promising way for open and lifelong learning, continuing training and collaboration for people. Educational opportunities are created for all citizens, irrespectively of time and geographic obstacles. Knowledge transfer from instructors towards trainees is accelerated, and it becomes easier for domain experts to participate from distance. The produced knowledge incorporates trainees' experiences and is related to real problems and situations, is filtered, enriched and restructured in order to be more useful for all. Although the development process has been well defined, the obstacles for the development of a community are many. First, the economic cost of this attempt should be considered in contrast to the expected merit. Second, the main danger for a fully functional community is the limited attendance and contribution of members, which is due to the increased professional and other obligations, to the lack of personnel to the opposition to change and to ICT technologies, etc. Seminars on ICT technologies and tele-education methods can change this attitude. The progressive adaptation through short and easy courses is another good practice. Finally a critical point for the successful performance of a Community is the participants' behaviour

and the quality of educational material and services. The building of trust to the community will start from a respective Scientific Council and Administration Board.

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