USE OF A CONTENT MANAGEMENT SYSTEM FOR BLENDED LEARNING: Perceptions of Pre-Service Teachers

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INTRODUCTION

Due to the rapid changes in daily life and in information technologies (IT), there occurs a need to shape educational institutions parallel with technological innovations. In order to transfer updated and reconstructed knowledge and make efficient use of IT technologies, pre-service teachers should use the latest technology for both keeping themselves up-to-date and transferring what is learned to new generations. Unfortunately, traditional educational system is not capable of meeting those expectations and there is a need for a solution to be proposed.

These expectations about how to use new technologies more efficiently in education is an important option to propose new solutions. In order to meet these new learning needs, technology-enhanced learning environments within the scope of distance education and e-learning environments need to be designed incorporating text, graphics, animation, sound and video. In addition, these online environments need to be interactive, easily accessible and usable for distance education learners.

One of the solutions which can be helpful for both students and teachers in an e-learning environment is to use content management systems. A Content Management System (CMS) is defined as a combination of three distinct concepts by Lurie (2002): content, process and technology/software. Content is the text, graphics, animation, sound and video and all other media that comprise the base for the system. It is always crucial to be arranged in order to present more flexible, interoperable and manageable environments for users. A process is defined as the sets of activities which take one or more inputs and execute actions to produce outputs. These inputs can be performed by the system, the user, by someone else entirely, or by a combination of actors. For our purposes, a process refers to the ways integrated into the system in order for users to perform tasks like download, publish, and share. Lastly, you need technology/software to perform your process to control your content over the Internet. Furthermore, it is clear CMS has no meaning without users; people can be considered as another important concept for CMS. Thus, the workflow in a CMS can be summarized as illustrated in Figure:1.
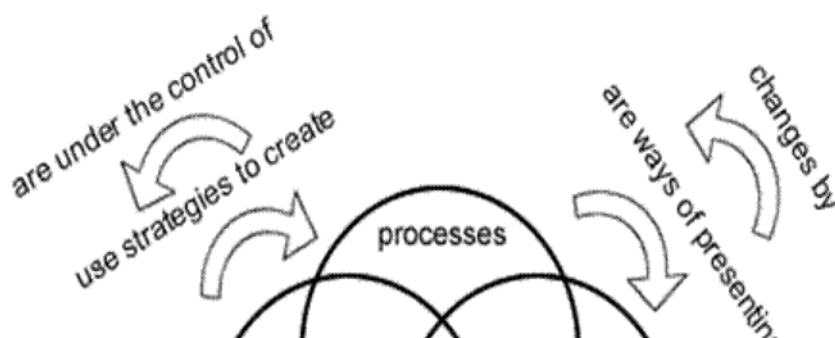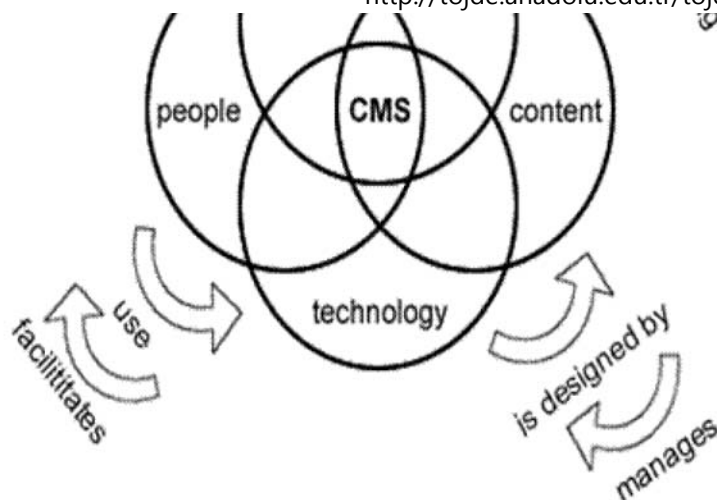
Figure: 1 The workflow in CMS

There are many types of CMSs software which have been designed and developed by hundreds of man-hours of work, and are successfully incorporated into web sites and intranets. Unfortunately, when one has to select one of them, it is really hard to have much clue as to how they work. Moreover, if one wants to customize the code according to personal/institutional needs, s/he often has to struggle through vast amounts of code to find where to modify (Zeidman, 2004). On the other hand, if one decides to write his/her own CMS, it will be much easier to address the personal/institutional needs and modify the code. The features integrated in such a personalized interface will be fewer compared to existing commercial CMSs, but having lots of features may not always what's needed. To conclude, both using a commercial or in-house CMS has its advantages and disadvantages to be considered.

In educational contexts, there is a huge amount of data traveling among teachers and students. These data may be comprised of worksheets, handouts, homework, reports and so on, which mostly requires feedback from teachers.

Furthermore, recent evaluation techniques used by teachers like rubrics, portfolio assessments, self-evaluation and peer-evaluation means more and more data is traveling. Thus, content management systems may organize student work in a proper way by keeping high volume of data and presenting information based on the user needs.

CONTENT MANAGEMENT SYSTEMS FOR BLENDED LEARNING

Basic purpose of any CMS is to manage information workflow in a database and publish the content onto web environment. Although this purpose is standard for any kind of users, the process of content management and the way to present it to other users may differ according to various user needs. These various needs may range up from simple tasks to complex ones. According to Robertson (2003), a CMS can be used to create, store, update, publish and present information. For educational purposes, a CMS can be used within a course in order to watch the workflow of tasks, to reach course content and to submit assignments. Furthermore, using CMS as a support to classroom instruction will form the structure for blended learning.

Blended learning is the combination of both traditional instruction and e-learning. In this way not only students benefit from the interactivity in the classroom environment, but also they got familiar with the technology and easily manages their work. They are provided with the most features of e-learning like independence from time and place, communication with teacher and peers from anywhere and any time by being in a virtual instructional environment. From the teachers' point of view, the integration of technology into the classroom environment should be successfully implemented.

When used for educational purposes, effective management of online information (text, audio, video, animation, interactive applications, question bank etc.) and applications (store, add, modify, update etc.) is very important for both pre-service teachers and instructors. Thus, the most important feature needed in a CMS is simple navigation and effective usage to control processes for managing content and users. Hence, both pre-service teachers and instructors will seek following features to carry on instructional activities.

> ➢ Effective management of information
> ➢ Easy navigation
> ➢ Easy to access and use
> ➢ Clear directions and tasks

> ➢ Hierarchically organized
> ➢ Interactivity
> ➢ Different interfaces and functions for different user groups
> ➢ Flexible user and group management
> ➢ Easy to use communication tools (Palloff & Pratt, 2001; Sloman, 2001).

While designing such a system in web environment, knowledge, performance and learning should be in harmony with users to provide effective usage to support tasks such as easy access (Schaffer & Douglas, 2004). These kinds of systems, as seen in different research studies (Stephenson, 2001; Rudestam & Schoenholtz-Read, 2002), will meet various educations needs by addressing individual learner differences and broaden the limits of in-service training opportunities. The necessity for reflection of developments parallel with technology to educational systems and effective use is an inevitable reality (Garrison & Anderson, 2003). The use of such a system in a course will bring many advantages to teaching-learning process and people like;

> ➢ Diffusion of using similar systems to share knowledge,
> ➢ Collecting of information like exam, homework etc. in a common place,
> ➢ Giving immediate feedback to learners,
> ➢ Following learners' performances in detail, and
> ➢ Improving data sharing among learners.

Using a CMS is also helpful for developing up-to-date and correct information, improving system administration and lowering expenses (Han, 2004). Furthermore, using a CMS for communities is considered to provide simplicity for reaching the following goals:

> ➢ Creating workflow administration,
> ➢ Creating depository for reusable content,
> ➢ Separating content from design and view,
> ➢ Managing and controlling content,
> ➢ Handling structures for using metadata,
> ➢ Archiving and version control,
> ➢ Ease of use with security, and
> ➢ Depending on web-based system and database (Powel & Gill, 2003).

Like in traditional learning, blended learning also requires organizing and structuring the content and makes content easily accessible. Meaningful learning cannot be reached if learners could not establish relations between prior knowledge to what they have just learned. Thus, for effective learning, knowledge should be shaped by learners not by teachers. (McGill et. al., 2005). When knowledge acquisition, management and publishing process becomes complex in teaching-learning environments, web-based content management systems are needed to make things easier. The amount of content which the community owns, the amount of documents, modifications and updates that the community handles will be managed easily by a content management system (Bobkio, 2002). Furthermore, students can learn many things related with the course topic while using the content management systems as in the form of blended learning. Content management systems can be easily used by any student without requiring technical knowledge, and furthermore information can be reusable within such a system (Cox, 2002).

ENIYISI: A CMS developed for Blended Learning

Having considered these benefits of using a CMS for educational purposes, a content management system, ENIYISI, has been developed by the authors (Altun, Gülbahar, Madran & Gürer, 2006). ENIYISI (E-öğreNmede İçerik YönetİM Sistemİ) is a content management system, which aims at providing an environment for knowledge makers to collect, share, distribute and re-organize their materials within a specific community.

ENIYISI is the Turkish

Figure 2- Standard navigation components for users

synonym for the phrase "Content Management System for E-Learning". The system is developed by using PHP and MySQL. PHP is an open source, server-side scripting language that used to create dynamic web pages. Since it is an interpreted language, a web page defined via PHP gets loaded, interpreted and executed each time it's invoked. MySQL is also supporting PHP being a part of

Apache web server.

Since the system will be used within courses, users are categorized in three levels as administrator, instructor and learner. The main template for user interface of the system does not change, but user functions are changed according to user type. The standard features provided to users are; main page, my place, communities, communication, search and admin panel which is shown in Figure-2.

In the "main page", the user view the information about new messages, last stored files and five most top rated resources, and add files to the system. In "my place", the user can add new files, and view the files s/he stored before and update the file and metadata about the file and delete it. S/he also takes information about the number and size of the files s/he downloaded to the system. Once a user clicks on a file, detailed information about any file in the system can be reached. This information is grouped under four headings; (a) detailed resource information, (b) detailed file information, (c) share control, and (d) comments about the file. The user also views the file by clicking "Preview" button.

In "communities", the user views all the communities and applies for being a member. The user also access to the ones which s/he is the member of. In "communication", the user sends messages to other members of the community that s/he registered. Users also enter the "Forum" and communicate through "Chat" within this part. In "search", the user makes basic and advanced research. In "admin panel", the user views the site map of the system, and makes changes through the authorized processes like updating personal information, modifying my place, downloading new file and processes related with communities, which are permitted by the system. The functions which can be performed vary according to user type. For example, while the student can only view and download the community's files, the instructor can update the metadata, upload and delete the community's files.

To sum up, the system has two main functions for any user. One is to download a file, enter metadata about the resource, and suggest this file to the community. The other is becoming a member of a community, sharing the files and accessing the ones which are shared by others. In this study, the system users, pre-service teachers and classroom instructors, adopted ENIYISI as a collaboration and communication tool for carrying out classroom activities like group projects, file sharing and commenting on peer reviews within their own community of practice.

Success of any technology integration into instructional process depends highly on users' acceptance of the system rather than the system itself (Rogers, 1995). Therefore, it is important to understand how participants interact within the system when they are given such a tool to organize their own communities of practice. More specifically, this research study explores pre-service teachers' perceptions about the use of a CMS when they are given such a tool in general, and their suggestions about ENIYISI in particular.

METHODOLOGY

As the main goal of this research was to investigate the perceptions of learners about using a CMS as a support tool for classroom instruction, i. e. for blended learning, this research utilized qualitative research methodology. A qualitative paradigm is appropriate when researchers do not have any control over the setting (Patton, 1995) and explore the lived experiences of participants (Lincoln & Guba, 1985).

Participants

The pre-service teachers of various grades from faculties of education of one private and one state university were the participants for this study. Participants used ENIYISI in different courses offered by different instructors. While using ENIYISI, learners are expected to create, store and modify files, organize these files for future use and share files with others. For achieving this goal, weekly assignments were given to participants and they are expected to share their own work with peers and communicate through the system.

During the implementation phase of ENIYISI, 191 students in six different courses from three different universities registered to the system. Among 191 students, 65 of them voluntarily filled out the questionnaire.

Data Collection and Analysis

For gathering learners' perceptions about their experiences with ENIYISI, five open-ended questions were asked. These questions were expected to reflect learners' personal experiences. The answers to the questions were taken via a password-protected web-based questionnaire. This questionnaire included a section for demographic information and the following guiding questions:

- ➢ **Evaluate the tools' contribution to the system usage. Please write down your thoughts in detail.**
- ➢ **Which features you favored the most? Please explain in detail.**
- ➢ **Explain in detail the obstacles you faced while using the system.**
- ➢ **What can be done to improve the usability of ENIYISI? Please write down your suggestions.**
- ➢ **Please state your positive/negative ideas about features (my place, communities, communication, search and admin panel) provided in ENIYISI.**

The data were analyzed through content analysis. Content analysis is conducted for reaching concepts and connections to explain the data. For this purpose, collected data is firstly conceptualized, then organized in a logical manner and lastly themes explaining data were formed (Strauss & Corbin, 1990).

Inductive approach is used to reveal concepts and connections within data. Furthermore, to make comparisons between the emerging themes, the frequencies were calculated. In this way, themes were clustered according to participants' articulation of their experiences.

FINDINGS

A preliminary descriptive analysis has been conducted in order to observe how participants interacted with and within the system. In this section, firstly, these findings are reported.

Table: 1
Descriptive Statistics for Participants' Grade, Gender, Having Computer, Having Internet Connection, Daily Computer and Internet Use

Grade			Gender			Have Computer			Have Internet Connection			Daily Computer Use		
	f	%		f	%		f	%		f	%		f	%
Freshman	-	-	Male	35	53,8	Yes	61	93,8	Yes	41	63,1	<1 Hour	6	9,2
	8	12,3		29	53,8		3	4,6		23	35,4	1-3 Hours	21	32,3
Junior			Female			No			No					
	48	73,8		1	1,5		1	1,5		1	1,5	3-5 Hours	16	24,6
Sophomore			Missing			Missing			Missing					
	9	13,8										>5 Hours	22	33,8
Senior														
Missing	-	-										Missing	-	-
Total	**65**	**100**	**Total**	**64**	**100**	**Total**	**64**	**100**	**Total**	**64**	**100**	**Total**	**65**	**100**

Table-1 shows the frequencies of grade, gender, having a computer, having an internet connection, daily computer use, daily Internet use, computer experience, computer skills, and Internet skills.

Table: 2
Descriptive Statistics for Participants' Daily Internet Use, Computer Experience, Computer Skills and Internet Skills

Computer Skills			Internet Skills			Daily Internet Use			Computer Experience		
	f	%		f	%		f	%		f	%
Beginning	2	3,1	Beginning	5	7,7	<1 Hour	17	26,2	<1 Years	3	4,6
	56	86,2		51	78,5	1-3 Hours	17	26,2	1-3 Years	11	16,9
Intermediate			Intermediate								
	7	10,8		9	13,8	3-5	14	21,5	3-5	19	29,2

Advanced			Advanced			Hours			Years		
Missing	-	-	Missing	-	-	>5 Hours	16	24,6	>5 Years	31	47,7
Total	65	100	Total	65	100	Missing	1	1,5	Missing	1	1,5
						Total	64	100	Total	64	100

As displayed in Table: 1 and Table: 2, most of the students who participated to the research are sophomore students (73.8%, Grade 3), and most of those sophomores (53.8%) are males. 93.8% and 63.1% of the students have computers and internet connection at their home respectively. Only 6 (9.2%) of the students stated that they use computer less than one hour in a day. Although, almost half of the students (47.7%) have been using computer more than 5 years, 86.2% and 78.5% of the students perceive themselves at intermediate level in terms of their computer and internet skills respectively.

In ENIYISI context, 184 students put files to the system with the average of 5.73 per student. Although 191 students registered to the system, 100 of them received messages with the average number of messages received 3.54 in a week. However, 58 of them sent messages through the mail server of the system, with the average of messages sent 1.98 in a week.

Learners' Perceptions about Tools' Contribution to the System Usage
The responses given to the first open-ended question are categorized under three themes. Emerging themes and perceptions of participants are grouped under

> - system usage,
> - user interface, and
> - file management, and sharing.

System Usage
About system usage, 40 participants reported that it is easy, comfortable and comprehensible to use the system. One of the participants stated that immediate access to all the functions saves time, where two participants pointed out those tools improve systems' usability.

User Interface
User interface is perceived as simple, clear and comprehensible by 65% of the participants. They also declared that screen design and color choice was fine. One of the participants stated that: "It was somehow difficult to find the buttons at first entrance to the site", and another participant acknowledged his ideas as: "Buttons like erase, update etc. should be made more explicit".

File Management and Sharing
Participants perceived file management as sharing tools as a medium to boost their sense of being in a community. One participant stated that she "favored the community approach"; another participant added that community approach is "beneficial for collaborative group work" and another participant emphasized that the "interaction and sharing was very high in the system". Moreover, these tools helped participants "receive and develop different ideas and views by seeing various sources". However, only one participant raised the hardness of entering metadata via file description tool by stating: "It is hard to understand the file description tool; I could not find what to write in the fields".

Participants' Perceptions about Each Tool in ENIYISI
ENIYISI included five tools for users to describe, collect, share, store, modify, update and comment upon the files in the system. Participants perceived these tools as useful for educational purposes and usable to interact with. In this section, participants' experiences and reflections for each tool is summarized below.

My Place
The area named "My Place" is found to be user-friendly and helpful by 25 participants and some of them stated that this area makes the site appropriate for people. Some participants stated their complaints about the files which can be seen by searching before shared with others. Some other participants expressed their expectations about improvement of some features like sending mail for

this part of the system. Parallel with the ideas one of the participants said that "According to me this part is so well-designed that it makes me to feel the site as mine. Unfortunately, the files we download to the site can be seen by others without sharing. I don't want my files to be accessed by others before I share them". Similarly another participant expressed his/her ideas as: "This part is useful since you can see the files all together. Besides having a special area of my own is good".

Communities

The area named "Communities" is found to be purposive and useful by 15 participants. Moreover, 12 participants underlined that this area is so important for two reasons: communication and sharing. In different topics personal perceptions are stated. One participant proposed that: "When we entered the site the community which we are the member should come directly. It is not so fine to select the ones I am the member of it. The communities we are a member of should be seen at once, we should go to another page if we want to apply to another community". Another participant is stated that: "If the ones we are members should be active in communities' area where all the communities are listed, it would be more useful". While one participant suggested that "declarative information or picture can be used to mention the community", another said that: "I want to share files with communities which are formed from people I prefer. In this way we pretend to deal with huge numbers of files. We deal only with the ones that appeal us".

Communication

The "Communication" area is also found to be useful and easy to understand by many of the participants. While one participant said that "This part is important so that we report our problems about the system by this way", another participant expressed his idea as: "This part supports collaboration. Anyone can reach the others whenever she/he wants. Features like this make this area useful".

Adding FAQ (Frequently Asked Questions) part and a place for reaching community members and administrators e-mail addresses are also suggestions of some participants.

Search

About "Search" option, 49 participants stated that they can easily reach all the files they looked for. On this topic one participant said that: "Having various search options is really effective that the system meets different user expectations in this way. Furthermore, you can reach all files of all the communities from here". Another participant expressed his idea by stating: "This is the best working area of the system. Having the option of detailed search makes this area more usable". Parallel with this idea another participant said: "Having detailed search options brings quality to the site and it brings speed in access to files". On the other hand, one participant complaint about the search option by saying that "If we do not know the exact name of the file we cannot reach it, which makes our work difficult".

Admin Pane

The "Admin Panel" area is another part which is found to be useful by the participants. About this area, one participant thought: "Well-designed and easy to use area. Access is easy. Having such an area is good since I can update my personal information and change my password". Another participant said: "Grouping in Admin Panel is purposive. In this way use of this area gets easier". Yet another participant expresses his opinion as: "Having an area which I can control my personal information, communities and file sharing brings an administrative function. A suggestion about this topic done by one participant was that: "Some features existing in the "Admin Panel" area may be carried under the "My Place" area".

The Most Favored Feature in ENIYISI: Sharing for Learning

Another question in this study was to determine which features were perceived to be the most favored among participants. The most articulated feature (almost by the %90 of the participants) was related to the sharing tool. The participants formed a community where they shared their artifacts as well as documents on the way of learning within their domain.

Participants stated that sharing resources among their peers, between classes and universities as the most favored feature of the system. Creating communities and participating in different communities are found to be appropriate for collaborative group work by participants. Other positive features mentioned by the participants are; making changes in shared files, opportunity to update files, choosing preferences for sharing, entering metadata for files, specifying copyright information and opportunity to communicate via forum. Various options provided for search is also mentioned by 9 participants as the most favored feature of the system.

Some participants perceived the ease of sharing as a quick way of reaching other community members; whereas, some stated that such a quick sharing is to be kept in as personal, unless s/he opens it for sharing. In general it can be concluded that participants had different perceptions of a community. For example, one participant stated that she favored the community approach; another

participant added that community approach is beneficial for collaborative group work and another participant is underlined that the interaction and sharing was very high in the system. Moreover, getting and developing different ideas and views by seeing various sources is another positive point stated by participants.

Obstacles and Suggestions

Participants' perceived obstacles regarding to the obstacles they had faced while using the system were merged under two categories. These are related to file management and search tools. They perceived the obstacles for file management as time-consuming and demanding; and, for the search tool as less comprehensive than they had expected. Emerging issues for each theme are indicated below.

- *File Management*
  - Forgetting to suggest the file to community
  - Limitation to download size
  - Viewing problems
  - Getting permission to open file for sharing
  - No information about download time
  - Technical problems while downloading
- *Search*
  Only 6 participants stated that they could not effectively search the topic and could not find the file they were looking for. Some optimization for the search tool is reported to be necessary.

Regarding to these findings, different suggestions are also made by participants to increase the effectiveness of the system. However, these suggestions are varied too much so could not be categorized under a main theme. Therefore, based on the frequency of the articulated suggestions, the repeating statements were categorized under six themes, which are (a) simplification of search option, (b) simplifying the process of sharing files, (c) separating help option and giving more detailed information in this part, (d) encouragement of group work, (e) increasing the download size, and (f) canceling time out event are some of the suggestions declared by participants. Some other suggestions made personally are listed below.

- Message box can be placed under "My Place" instead of home page.
- Those who forget username or password can reach this information by answering a secret question.
- User can be informed about new uploaded files via e-mail upon request.
- Navigation menu can be expanded.
- Pictures can come in small boxes without any click.
- Sub menus can be hidden under main menu and may be visible when mouse gets over it.
- Users who are online at the moment can be listed.
- Site map can be added.
- A forum for general purpose can be created.
- Feasible parts of the site can be accessed by those who are not members of the site.
- Monthly comments can be published by community members.
- Personalization option can be added for navigation menu.
- A menu for frequently used commands can be created.

About personal suggestions one participant stated that "Offering a file to a community should be asked through a small box after downloading the file. This will make easy and speed up the process of controlling sharing". Another participant proposed that "A mail should be sent about the latest downloads those who preferred to be informed".

Yet another idea proposed by a participant is that: "If picture files are viewed in small boxes, we don't need to click each of them to see". The site should be opened to all people who deal with animation, graphics etc. in order to share their work more effectively.

CONCLUSION

The main reason for developing such a system was to explore how learners perceive the use of a CMS when they were given the tools within a "building a community" metaphor. The findings of the study indicated that pre-service teachers perceived the use of a CMS in an educational setting as purposive and useful in as much as they developed a community approach and shared their work with others. Meanwhile, most of them also suggested embedding more communication tools, such as a forum, to the system. Although some difficulties in downloading and viewing files are reported, there were too few problems stated about file management. These technical problems may also be related to other reasons like internet connection speed, personal software problems etc. Search option was also favored by pre-service teachers.

The findings of this study indicated that participants initiated collaboration and sharing within a community without prior instruction.

In the field of educational technology, it is an often repeated motto to emphasize teaching with technology rather than teaching the technology itself (Norton & Wiburg, 1998). This tool enabled community members (both students and instructors) interact with each other and work on their learning tasks simply by keeping the tool as "a tool for learning".

Active participation was regarded by students as the most important factor influencing the success of online groups (Chou, 2002 and Gabriel, 2004). In their research study, Vonderwell (2003) explored active participation and found that students commonly reported a disadvantage of online learning to be the lack of "one-on-one relationship" with the instructor. This study indicates that as students interact with each other and with their instructors in a community metaphor, they do not tend to perceive it as an obstacle. Moreover, they recommended more tools to be incorporated to foster such an interaction. One reason for this solution might be the fact that participants in this study had a relatively longer period of experience, higher level of computer experience and internet usage.

One of the premises of e-learning is to bring people from different geographical regions time and space independently (Khan, 2001). Using such a tool, definitely serves for such a need as learners find a chance to come together and share their work with their peers. In this study, participants from geographically differently located universities formed such an environment which they perceived as an interactive community they belonged to.

The use of Content Management Systems (CMS) in educational context is relatively limited in adoption when compared to Learning Management Systems (LMS) and Learning and Content Management Systems (LCMS). Although their overall aim is to support learning by providing content, CMSs support learning by managing content, both in traditional classrooms and in blended learning environments.

As Govindasamy (2001) indicate, to provide a pedagogical foundation as a prerequisite for successful e-Learning implementation has clearly changed the emphasis from merely managing the logistics of electronically delivering e-Learning content, to managing e-Learning content. Future studies should point out the effectiveness of such systems. Through gathering suggestions, improving the system and reusing it, educators' aim should be improving the usability of such systems.

Thus, with action research and motivated communities using the system, similar research studies addressing effectiveness, ways to overcoming technical problems, and options for improving usability is encouraged. Experiencing the blended learning environment, the students effectively use all the tools provided to them.

This brings us to the point that, any CMS designed for educational purposes should at least consist of "My Place", "Communities", "Communication", "Search" and "Management" utilities. More communication tools like forum, chat should be added for varying group structures. Besides, both the user interface and navigation should be kept as simple as possible.

One more thing may be to give a short training to students about the usage of metadata before using the system. All these points may be considered as suggestions for both instructors and system designers.

Realizing how such a system facilitates students' creativity and effects their communication with each other was really surprising. Having flexibility in a virtual learning environment was a different experience for the students.

When their suggestions are investigated, it is obvious that they questioned their social presence and wanted to personalize the system according to their preferences. Thus, since use of CMSs encourages peer learning in virtual learning environments, such systems should be added more features for personalization for both as an "individual" and as a "group".

Morgan (2003) stated about this topic that: "The technology also must become more sophisticated and flexible – particularly with regard to content management and groupware functions and the definition of roles – in order to satisfy current users" (p. 1). By this way, effective use of learning and teaching strategies will also be more possible than ever.

In other words, as the Harrington, Staffo and Wright (2006) stated that "Research has shown remarkable insights on the student side of the online teaching-learning equation, but more must be done from the faculty perspective" (p. 186).

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REFERENCES

Altun, A., Gulbahar, Y., Madran, O., Gurer, M. D., Design and Development of a Content Management System for E-Learning: ENIYISI, 2nd International Open and Distance Learning (IODL) Symposium,

Eskişehir-Turkey, pp: 557-571, (2006).

Boiko, B. (2002). *Content Management Bible*. New York: Wiley Publishing.

Chou, C. (2002). A comparative content analysis of student interaction in synchronous and asynchronous learning networks, *Proceedings of the 35th Hawaii International Conference on System Sciences.* Retrieved on May 2, 2005 *from* http://csdl.computer.org/comp/proceedings/hicss/2002/1435/05/14350134b.pdf.

Cox, C. (2002) Becoming part of the course. *College & Reseach Libraries News, 63(1),* 11-13, 39.

Gabriel, M. (2004). Learning together: Exploring group interactions online, *Journal of Distance Education*, 19(1), pp. 54–72.

Garrison, D. R. & Anderson, T. (2003). *E-Learning in the 21st Century*. USA: RoutledgeFalmer.

Govindasamy, T. (2001). Successful implementation of e-Learning: Pedagogical considerations. *The Internet and Higher Education*, 4(3-4), 287-299.

Harrington, T., Staffo, M. & Wright, V. H. (2006). Faculty Uses of and Attitudes toward a Course Management System in Improving Instruction. Journal of Interactive Online Learning, 5(2), 178-190.

Khan, B. H. (2001). *Web-Based Training*. Englewood Cliffs, NJ: Educational Technology Publications.

Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic Inquiry*. Beverly Hills, CA: Sage.
Lurie, I. (2002). A Web Content Management Blueprint: Planning for a content-rich, successful web site. Retrieved on September 14, 2007 *from* http://www.portentinteractive.com/library/cmsexplained.pdf

McGill, L., D. Nicol, et al. (2005). Creating an information-rich learning environment to enhance design student learning: challenges and approaches. *British Journal of Educational Technology, 36(4)*, 629-642.

Morgan, G. (2003). Faculty Use of Course Management Systems. (EDUCAUSE Center for Applied Research ID: ERS0302). ECAR Key Findings. Retrieved on December 12, 2007, http://www.educause.edu/ir/library/pdf/ERS0302/ekf0302.pdf

Palloff, R. M. & Pratt, K. (2001). *Lessons from the cyberspace classroom: The realities of online teaching*. USA: Jossey-Bass Inc.

Patton, M. Q. (1987). *How to Use Qualitative Methods in Evaluation*. Newbury Park, CA: Sage.

Powell, P., Gill, C. (2003). Web Content Management Systems in Higher Education, *Educause Quarterly*, 2, 43-50.

Robertson, J. (2003). So, what is a content management system?. KM Column. Retrieved on May 19, 2006 *from* http://www.steptwo.com.au/papers/kmc_what/pdf/KMC_What.pdf

Rogers, E. M. (1995). *Diffusion of Innovations*. Fourth Edition. NY: Free Press.

Rudestam, K. E. & Schoenholtz-Read, J. (2002). *Handbook of online learning: Innovations in higher education and corporate training*. Sage Publications, USA.

Scahffer, S. P. & Douglas, I. (2004). Integrating knowledge, performance, and learning objects. *The quarterly review of distance education*, 5(1), 11-19.

Sloman, M. (2001). *The e-Learning revolution: From propositions to action*. Great Britain: Chartered Institute of Personnel and Development.

Stephenson, J. (2001). *Teaching and Learning online: Pedagogies for new technologies*. Great Britain: Biddles Ltd.

Strauss, A. L. & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA:Sage.

Vonderwell, S. (2003). An examination of asynchronous communication experiences and perspectives of students in an online course: a case study. *The Internet and Higher Education, 6*(1), 77-90.

Wiburg, K. & P. Norton. (1998). *Teaching with Technology*. **Belmont, California: Harcout Brace & Company.**

Zeidman, P. (2004). Creating a PHP-Based Content Management System. Retrieved on June 14, 2006 *from* **http://www.intranetjournal.com/articles/200407/ij_07_06_04a.html**