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Distance Learning for Design Education

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Abstract: - The research work presented here, focuses on the possibilities of incorporating the advantages of distance learning on design education and teaching programs. It is part of the research work between TEI of Athens and Kent Institute of Art and Design. The research involves Italian, German, UK and Greek professors and design students. It investigates the possibility of incorporating the powers of distance learning in the design teaching process. It is also an exchange of ideas and information on the application of modern technology. The project was a way to exchange insights, research tools and methods that support distance learning and design research. All parties have been strongly benefited from the case study. Examples are presented, from the research work, the case study and the teaching programs, which are intended to contribute to the practice and active education of design. The outcomes of the project were presented in mainland Europe as an ongoing initiative for understanding the European design industry. The total design research work is accessible on the Internet for the common use of all students of the institutions involved, and it is part of their academic curricula.

Key-words: - Distance learning, Educational collaborations, Learning systems, Modern technology, Design research, Design and culture.

1. Introduction

The paper describes a four-year Socrates funded European Module consisting of four schools of design across Europe: Kent Institute of Design KIAD, Rochester, UK, the coordinator; Fachhochschule fur Technik und Wirtschaft FHTW, Berlin, Germany; Nuova Academia De Belle Arti, NABA, Milano, Italy and Technological Educational Institution TEI, Athens, Greece.

The unique feature of this project and the case studies is that it provides the opportunity for European students to explore product design issues from their home base. The four schools have collaborated throughout the project, exchanging project briefs and learning source materials.

The field of the case study and the educational projects cover parts of the European cultural heritage. The emphasis was on working with selected products/designs that students felt more familiar with, and are also the richest in possibilities for product developments with a commercial future.

Distance learning was included in the project, since a database with information and links to design development and design industry was attached to the sites of all partners. This database remains a valuable tool for research, especially among the students of the countries involved. None of the partners had previous experience in delivering distance learning in this particular field. The development of communication systems was therefore seen as an experimental first step and as means of attracting greater industrial involvement in the educational process. It generated opportunities and possibilities not only for students and educators but also for people in industry who lack a wider knowledge of the European scene. At the same time, it assisted in bringing more up to date industrial knowledge and experience to the staff and the students in the University environment.

Educational opportunities for people in industry, through the university environment, was identify as missing in all the four participating countries and the introduction of such opportunities is the originality of the present European Module.

2. Teaching and learning

Learning cultures vary greatly. The usual way in the design field is the individual, studio-based culture, while design students are more accustomed to learning through teamwork, collaborative activities and peer assessment. Some disciplines, such as History of Art, offer a more traditional, academic approach to study, while in others, such as product

design, learners prefer a more practical, visual, approach. Learning styles differ in line, since design learners are 'visual thinkers'. They appreciate materials, which are well conceived visually, but they can be critical or dismissive of those, which may not meet their aesthetic preferences. They also respond well to materials or activities that provide them with the stimulus to create something.

The occurrence of dyslexia in art and design does not affect their study. Many gifted students who use the new, visually oriented technologies are dyslexic or have other academic learning difficulties. Currently, art and design students are learning to use a range of tools, among which, the most popular are Web and e-mail services.

The research team interviewed students on their best ways of learning. The results leaded towards four primary processes being involved in an overlapping way: Wanting to learn, learning by doing, learning from feedback, digesting learning materials.

Further questions about the place and the time of learning, revealed that most people considered that they learn best: At their own pace, at times and places of their own choosing, often with other people around - especially fellow-learners and when they feel in control of their learning.

Although it can be argued that in the design field most learning happens "independently", this does not degrade the role of the instructor. Instructors help learning to take place by providing learners with resource material and chances to test their learning, by giving learners feedback on their progress and by helping learners to make sense of what they have learned.

Nevertheless the greatest part of learning is independent learning. Some examples of independent students' learning in action are the following:

-In the case that students learn from lectures, much of the actual learning takes place after the event.

-In the case that students learn through practical work, most of their learning is done in an individual pace.

-In the case that students learn from learning resource materials, most of their learning is done independently.

-In the case that students learn from open learning materials, they are essentially learning at their own pace and in their own ways.

-In the case that students learn from each other, the methods used have all the features of independent learning.

Another great part of learning is resource-based. Learning resources take many forms, including human resources (tutors, fellow-students) and information-type resources (books, databases, on-line databanks, learning packages, lecture notes, manuals). For successful learning to take place, it is important that students have sufficient motivation to learn. Additional parameters for successful learning are:

-Learning resource materials should be sufficiently attractive and interesting,

-Independent learning should rely on practice,

-Effective learning resource materials should provide students with carefully chosen tasks and exercises,

-Students need feedback on the progress of their independent learning,

-Students that learn independently need opportunities to reflect on what they have learned.

Traditionally, the most important types of learning resources used to be paper-based, particularly books, journal articles, handout materials and the student notes. Nowadays, the range of media available to support student learning is extended due to many technological developments, and includes: Interactive computer-based packages that use a variety of formats and interactive computer-based communication media. They include computer conferencing, electronic mail, on-line databases, and the Internet. Media-based resource material is also available, such as videotapes, audiotapes, and practical kits, and applications of communication media, such as telephone tutoring, teleconferencing, and video-conferencing.

Students in today's technology-rich higher education environments are presented with unprecedented opportunities to use and integrate the new tech, technology tools and electronically accessed information resources into their academic studies. The rapid development of assistive technology makes it possible for individuals with a wide range of disabilities to gain access to computers, networking and telecommunications technologies and multi-media products.

In the context of learning from each other, with or without high-tech media, important learning outcomes can be achieved through games, simulations and role-play exercises.

E-learning and distance education courses need to be designed in such a way that learners with different backgrounds and preferred learning approaches will feel motivated and gain the best possible learning results from such courses. It is a challenge for instructional designers of online/distance education courses to determine learners' preferred learning approaches and related

social and cultural issues, and to design learning environments to meet these needs. Designers of such programs should consider cultural differences in their design as students of different cultural backgrounds may have different perspectives and interpretations of learning content. Print-based materials, CD-ROMs and audiotapes readily support independent learning, while traditional classrooms, the Internet and the telephone provide fruitful environments for interactive learning, interactive here meaning communication among learners and between learners and educators.

The rapid changes and increased complexity of today's world present new challenges and put new demands on our education system. There has been generally a growing awareness of the necessity to improve the preparation of students for productive functioning in the continually changing and highly demanding environment.

3. Designing Distance Education

The fundamental dilemma for developing this distance education project were the multitude of issues that arise in distance education, including the course development process, how the course will be taught, what kinds of assessment will be used and the ever-present bugbear of schedules and timelines. This is finding the balance between creative measures and the demands of systems that seek conformity to a standard, efficient method.

The focus was on the activities and on the interaction between participants that would help build a learning community. A four-year project can get into as much trouble with timing as one scheduled for six months. Teamwork is an area that requires delicate handling, as power relationships can begin to emerge. If clumsily handled this can lead at best to hurt feelings, and at worst, a failed project. Online education is being heralded as meeting the needs of students' lifestyles by managing time conflicts and access from remote locations, and helping people to juggle personal commitments.

Keeping in mind all the aforementioned factors, the research team designed the case study including processes and resources that assisted the multicultural participating students to undertake research and complete distance learning in an effective way, concentrating on the learning side of the teaching-learning equation.

3.1 Establishing Distance Design Education

Between the participating Institutions were differences in delivering design education and application, but the target was common - innovative improvement of the design education field with the use of modern technology and distance learning. Rather than rushing to put everything online, the partners kept the printing presses rolling and used the Internet for what it's good for: communication through e-mail, discussion, assignment submission and feedback. This has helped overcome slow communication, one of the fundamental weaknesses of distance education. The working module adapted by the partners had the following steps:

- Introduction: the plan and the necessary information.
- The staff: those involved, who will develop and teach the course, what support will be involved, what will be the roles of the team members, who will be the project's coordinator.
- The students: who will study the course, what are their backgrounds, experiences and learning needs, what support and preparation will they require in adapting to distance learning.
- Subject description: subject title, points' value, level/prerequisites and the subject's relation to the rest of the course.
- Aims and objectives: the overall goals for student learning. Well-designed objectives can provide a basis for later construction of assessment items.
- Content outline: what the students are expected to learn in order to meet the aims and objectives.
- The learning environment: what teaching and learning methods will be employed for students to achieve the objectives.
- Interaction and activities: how students will interact with academic staff and with each other, and describes the learning activities.
- Assessment: the overall assessment structure, examinations, essays, reports, investigations or problems, time lines and policy.
- Learning materials: all materials students need to complete the course, texts, readings, audio visual and multimedia elements, and which they will need to purchase.
- Student requirements: anything that students might need to study effectively, such as Internet access.
- Learner support: tutorials, library, information technology, administration, learner-teacher contact or learner-learner contact.
- Development schedule: lists the major components of the course, indicating when and by whom the components will be developed.

- Evaluation: evaluation strategies; peer evaluation, trials, interviews, focus group discussions, questionnaires.

The great thing about this kind of work is that it's fundamentally about people. This is why no neat prescriptive system can ever hope to cope with all the complexities of course development in distance education. Far more important than the system is the quality of the people. Persons of talent and commitment can overcome the deficiencies of a system, but no system can cover up the deficiencies of uninterested and uncommitted people.

4. Design Research

Design means, "to invent and bring into being". Thus, design deals with creating something new that does not exist in nature. Design research by definition changes the state-of-the-world through the introduction of novel artefacts. The design of artefacts is an activity that has been carried out for centuries. This activity is also what distinguishes the professions from the sciences. "Schools of architecture, business, education, law, and medicine, are all centrally concerned with the process of design". The art of design is very closely related with materials, purposes, forms and styles. Design is the product of its time and heritage acts as a catalyst that enables the expression of designs, which are inspired by the same fauna and flora, in a different fashion, according to the culture in which it exists. Education is a very important factor in forming culture/design consciousness and the increasing opportunities offered by multimedia and the Internet can help to approach the values of tradition, design and heritage.

5. The Case Study

Twenty-five students from each university participated in this project. With the assistance of design business, they investigated the possibility of a product design theme that has common interest at a supranational level and can be undertaken and fulfilled as a long distance program, together with other schools of design of different countries and cultures.

Since the early 90s' TEI of Athens has been searching for new product designs inspired by cultural heritage, which can be approached and handled using modern technology. The intention was not to educate future designers in how to duplicate the past in their design proposals, but to enable them to create, and propose to industrial and craft producers, realistic designs inspired by the study of tradition and heritage. Convinced that the lack of cultural definition and identity could -in the long run- have a negative effect not only on the development of product design but also on the economy, we also aim to economically develop the design business. Thus, the knowledge of cultural heritage becomes an important marketing tool - since design is one of the basic components of marketing.

A special strength of Greece is its location between East and West – Asia and Europe. Greece is geographically and culturally in between, so its cultural heritage, its emphasis on traditional arts and crafts, sometimes becomes an obstacle in the collaboration with more technologically developed countries. So far, product design has not succeeded in taking advantage of these qualities. The research team decided to focus on improving this situation by proposing as case study the product design development that is based on local heritage. The motivation to create something new and challenging, based on cultural data, for distance education and for the financial well being of the design business was considered as an innovative approach/technique to the participants educational systems.

5.1 Work methodology

The actions taken during the four years of the project were: Two year of research into the design industry combined with a parallel study of the local history of design. One year for the completion of the case study. One year for dissemination together with a parallel application of the project in our local academic curricula.

All partners used the following actions and teaching and learning strategies, in relation to the project:

- Meetings to discuss the project and outline the main activities,
- Produce framework of tasks for each partner to undertake,
- Find information related to the industry of each country,
- Create a method of reporting on the progress of each partner in the activities,
- Produce two questionnaires for each partner to provide written feedback on the progress on the undertaken tasks,
- Produce two questionnaires for each partner to provide a written proposal for module implementations,
- Presentation of previous works via CD-ROMS, Internet and hard copies,

- Questionnaires for the students' interviews with the design industry,
- Assessment strategies,
- Presentation of results and outcomes for evaluation,
- Produce a web site that illustrates: The profile of all partners, information on the participating institutes, the results of all partners and the information data that all partners selected.

For all the Greek participants, the case study took place in the Interior Design Faculty of TEI of Athens. Participants from all the Universities, working on the project, were directed to the commercial and industrial chambers, affiliations and other cooperative organisations, to use as documentation centres for publications on the design industry and the local design heritage.

All participants were required to collect information on production and marketing strategies of design companies through personal research, interviews and literature research. All students had access to sources and experts, as well as opportunities for visiting collections, workshops, businesses, Museums and design cooperatives. The adapted teaching methodology included formation of a database, analysis of the design producers and design marketing companies and questionnaire-guided interviews on the design industries.

6. Discussion

Our successful educational synergy proved that modern technology is a valuable tool for sharing knowledge. The recently growing and enduring emphasis for technological applications in design education will definetly open new horizons to students and universities. The outcomes from the case study are many, the most important for the research team are:

-Successful design innovations happen when efficient synergies are in place,

-Initiative, imagination and the application of technology make the establishment of long-distance design research and teaching/learning programs possible, implicating students and educators of different cultures and languages,

-The application of technological achievements can create educational networks on themes of common interest that will share innovation projects among partners, cooperation bodies and innovation agencies. Also:

-Provision of learning materials concerning the size and geographic location of the design industry in Europe, analysis of product types and of trade movements.

-Knowledge that product design development is multifaceted and operates on many different levels and across subject areas.

-Identification of information sources concerning the design industry in Europe (literature, data bases and organisations).

-Analysis by country of business practices, the industry and the interactions of companies in the total supply chain.

-Provision of case study material for the student to develop an understanding of supply chain organisation and intercultural team building.

7. Conclusion

All the above-mentioned results have indicated, as the best collaborative approach for long distance researchers/educators, the adaptation of the use of computer-mediated communication (CMC). That is, a system that allows groups to interact over time as well as over geographical location. This is a different type of interaction to that supported by videoconference systems, which allow people to be geographically dispersed, but require them to be present at the same time. E-mail, for example, is a simple form of CMC. The benefits of the use of asynchronous CMC systems for supporting group learning are flexibility, participation of quantity and quality, communication, openness/access, post-participation review/access for references. CMC systems allow learners to interact with one another over time.

Learning in a CMC environment can lead to deeper processing of material because time for reflection is allowed. It provides opportunities for group-work that would not otherwise exist, but it is not a panacea; the research team was well aware of that. The flexibility over time can also be a problem for participants. It may be days, before someone replies to a question. Decision-making can be difficult on-line, again due to flexibility over time. For the presented here research work flexibility over time was of the utmost importance and the minor problems were solved. Actually numerous positive learning outcomes were the result of this adaptation.

Computer-mediated communication can successfully serve as a learning medium for students with different ethnic/cultural backgrounds. Cultural backgrounds of learners should be considered in the delivery of both computer-mediated communication and face-to-face instruction by improving the presentation and developing richer learning in a transcendent multicultural context.

A hundred and twenty students participated in the module. The outcomes of their projects were delivered in CD-ROMS and presented in each participant's web site. The results of the module were included in the participants' educational courses as e-learning material. Approximately 500 full and part time students each year across the EM network have been benefit from the study of the project, and 30 members of full time teaching staff each year have been also benefited, either directly by helping to compile information, or indirectly, by being able to use it for teaching purposes. It has been estimated that more than 600 members of the design business have studied the module seeking for novel designs and inspirations and ten local cooperatives have produced products designed by the participating students based on local cultural data.

We wish that our case study would provide a working model for developing future research on educational projects, which will involve universities, professors and students from multicultural backgrounds that have the same extensive sensibility, feeling and vision.

References

[1] C. J. Bonk, *Online training in an online world*, Bloomington, 2002.

[2] C. J. Bonk, R. A. Wisher, *Applying collaborative and e-learning tools to military distance learning: A research framework*, Technical Report, US Army Research Institute for the Behavioral and Social Sciences, No 1107, 2000.

[3] R. Boshier, M. Mohapi, G. Moulton, A. Qayyum, L. Sadownik, M. Wilson, M. Best and worst dressed web courses: Strutting into the 21st Century in comfort and style, *Distance Education*, Vol. 18, No. 2, 1997, pp. 327-348.

[4] H. Byun, K. Hallett, C. Esses, Supporting instructors in the creation of online distance education courses: Lessons learned, *Educational Technology*, Vol. 40, No 5, 2000, pp.57-60.

[5] S. Carr, As distance education comes of age, the challenge is keeping the students, *The Chronicle of Higher Education*, Vol. 46, No 23, 2000, pp. 39-41.

[6] M. V. Champagne, R. A. Wisher, *Design considerations for distance learning evaluations*, 2005.

[7] J.S. Daniel, C. *Marquis, Interaction and independence: Getting the mixture right*, Teaching at a Distance, 14, 1997, pp. 29-44.

[8] M. Driscoll, *Psychology of learning for instruction*, Bacon, 2000.

[9] L. Harrington, Technology Works Best When It Serves Clear Educational Goals, *Harvard Education Letter* Vol. 13, No. 6, 1997, pp. 1-5.

[10] N. Harrison, C. Bergen, Some design strategies for developing an online course, *Educational Technology*, Vol. 40, No 1, 2000, pp. 57-60.

[11] J. Hawkins, E. Spielvogel, E. M. Panush, National Study Tour of District Technology Integration: Summary Report, *EDC/Center for Children and Technology Report*, 1998.

[12] M. Honey, K. Culp, F. Carrigg, Perspectives on Technology and Education Research: Lessons from the Past and Present, *U.S. Department of Education, Secretary's Conference on Educational Technology Proceedings*, 1999.

[13] W. Horton, *Evaluating e-learning*, American Society for Training & Development, 2001.

[14] A. Fiore, P. Kimple, *Understanding aesthetics*, Fairchild Publications, 1997.

[15] D. Gayeski, C. Sanchirico, J. Anderson, Designing training for global environments: Knowing what questions to ask, *Performance Improvement Quarterly*, Vol. 15, No 2, 2002, pp. 15-31.

[16] P. Kandlbinder, *Writing objectives*, The Centre for Teaching and Learning, University of Sydney, 1997.

[17] G. Kleiman, K. Johnson, Professional Development: From Reports to Reality, *Leadership and the New Technologies Perspectives*, No. 1, 1998.

[18] T. Kuhn, *The Structure of Scientific Revolutions*, University of Chicago Press, 1996.

[19] I. Lakatos, *The Methodology of Scientific Research Programmes*, Cambridge University Press, 1978.

[20] F.G. Lockwood, *Activities in self-instructional texts*, London Kogan Page, 1992.

[21] D. Murphy, P. Jamieson, L. Webster, What is flexible learning*? Flexible Learning Guide Number 1*, Centre for Higher Education Development, Monash University, 1999.

[22] D. Murphy, Still muddling through, *Open Praxis*, 2000, pp. 11-13.

[23] D. Norman, *The Design of Everyday Things*, The MIT Press, 1998.

[24] S. Rockman, *Leader's Guide to Education Technology*, National School Board Foundation's, 2004.

[25] G. L. Rosenkrans, Assessment of the adult student's progress in an online environment, *The Internet and Higher Education*, No 2, 2000, 145-160.

[26] J. Sandholtz, C. Rignstaff, D. Dwyer, *Factors That Affect the Effective Use of Technology for Teaching and Learning: Lessons Learned from the SEIR-TEC Intensive Site Schools*, Greensboro, SEIR-TEC, 1998.