E-Learning and Economic Development

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ABSTRACT

In this article, our experience in the development and realization of e-Learning courses in Slovenia is described and discussed. Slovenia, the most developed republic of former Yugoslavia, became an EU member in May 2004. In 1991, after its independence from Yugoslavia, Slovenia's transition to a free market economy resulted in lost jobs and an unemployment rate of 12%. In 1999, as the Institute for Symbolic Analysis and Development of Information Technologies, located in Velenje, Slovenia, we decided to offer several online courses to help unemployed people gain the skills and knowledge needed for employability in information technology.

We drew on our previous experience teaching online courses at Sarajevo University after the Bosnian war and on the experience of West Valley College from Saratoga, Silicon Valley in e-Learning. Over the last four years, we organized and delivered e-Learning courses in digital media design and production, with good results. Several students found jobs and changed their perception and attitude as they became more self-confident. We believe e-Learning can efficiently enhance lifelong learning and support economic development, especially in new member countries transitioning from former socialistic to free market economies.

Keywords: e-Learning, distance education, economic development, unemployment, transnational learning.

INTRODUCTION

The ideas and experience described in this article are rooted in the Bosnian war. One of the authors, Stanko Blatnik, taught at Tuzla University from 1997 until 1985 when he moved to Slovenia, the northwestern republic of the former Yugoslavia. At the end of 1994, in the third year of the Bosnian war and after several unsuccessful attempts, Stanko made contact with his colleague, dr. Fahrudin Oručević, from Sarajevo University using email. After establishing contact dr. Oručević and prof. Mesud Baručija, the head of Computer Science Department at Sarajevo University, visited Stanko in Ljubljana, the capital of Slovenia. Their discussion focused on the possibility of assisting education in Sarajevo, which was still in blockade. Prof. Baručija thought distance learning the only efficient avenue of support because several teachers from Bosnia's middle generation

emigrated from Sarajevo to different countries around the world. During the discussion prof., Baručija insisted on only one condition, that the learning process be interactive. After the details were complete, Stanko began teaching Sarajevo students online in academic year 1995/1996. At around the same time the Bosnian war stopped with the Dayton agreement at the end of 1995. Bosnia and Hercegovina was destroyed and, with its crushed infrastructure, only four students attended the course that first year. Communication was bad, email travelled for weeks and efficient organization was difficult. After locating grant funding, a face-to-face course was organized and the Bosnian students were invited to Slovenia.

The second generation of 13 students took place under better conditions. The Internet connection with Sarajevo worked more reliably and an e-Learning course covering computer process control was organized. Most of the communication with students took place using ordinary e-mail and IRC (Internet Relay Chat). Students worked in teams to prepare seminar work and final projects. At the end of the course a visit to Slovenia was organized where students observed the implementation of computer-based process control in real industrial conditions (Bosnian industry is still not working well) and participated in their final exam.

The results were promising and the online course with Sarajevo continued until academic year 2002/2003 although several modifications were made due to a lack of financial support. Beginning with academic year 1998/99 Sarajevo students did not travel to Slovenia, and in academic year 2000/01, the course transitioned from process control to XML (Extensible Markup Language) which is theoretical and, as a result, does not require special equipment.

The experience with Bosnian students was great; we learned a lot about e-Learning; its capabilities, advantages, disadvantages and problems. The main lessons learned realizing the courses at Sarajevo include:

a) **It is possible to organize good e-Learning with relatively modest technologies and tools**
b) **It is possible to transfer modern knowledge and skills to developing environments and places destroyed by war**
c) **e-Learning can play important role in the economic development of transitioning economies**
d) **Face-to-face meetings remain an important component in the educational process**

SLOVENIAN CASE

Stanko presented the Bosnian online course experience at several conferences in Europe (Blatnik 1999). At the July 1999 ICDE Conference in Vienna (International Conference on Distance Learning), Ellen Herda of the University of San Francisco introduced Stanko to Kelly Carey. At the time, Kelly taught Digital Media and Internet Services at West Valley College in Saratoga (a California Community College) and was in Vienna researching transnational distance learning (Carey 2000). After exchanging ideas, Kelly and Stanko began working on developing and realizing e-Learning courses in Slovenia in September 1999.

Slovenia, the most developed part of the former Yugoslavia, gained its independence after a ten-day war in 1991. Although its economy was not destroyed by war, Slovenia's loss of its formerly protected Yugoslavian market and its tumultuous transition to a free market economy resulted in the rise of the number of unemployed from 20,000 in 1988 to 140,000 in 1994 (National Employment Service).

In the same timeframe Slovenia's educational system, including both high schools and universities, did not change and remains today traditional and rigid, often producing specialists who are ill equipped to join the workforce. At the end of 20th century, there was no institution in Slovenia offering online education although the penetration of the Internet was strong and among the fastest in the former European socialistic countries.

During her first visit to the Institute for Symbolic Analysis and Development of Information Technologies in September 1999, Kelly Carey suggested to establish a Dynamic Learning Centre for Economic Development of Southeastern Europe in January of 2000. Kelly outlined the basic elements of dynamic learning she developed from her research and experiences in curriculum development and online course implementation.

DYNAMIC LEARNING

Educators need to see the world behind the text created by the Internet. The physical reality of working with students, in real time, across time and space is a staggering idea. The world it creates in the interpretation and application of its living text is beyond anything ever experienced in the world of learning and education. The Internet changes our linguistic experience with the world. Ideas exchanged between writers and readers create a fusion of horizons (Gadamer 1989) not geographically possible before this time. A new understanding, a transformation of our being takes place as we reinvent ourselves based on new experiences, new understandings and new relationships.

Hermeneutic theory allows us to understand the process of creating this new world (Ricoeur 1992). The ideas of tension, transformation, the power of language and identity, the creation and recreation of time help us to see how we are refiguring our understandings of ourselves online. The weakness lies in our present day understanding of the Internet as a physical reality rather than an ontological one. We don't view historic paintings as a combination of oils or important writing as a collection of words. Yet, we still view the Internet as a databased connection of convenience. However, as with a painting or book, its power lies in the stories it tells, in the connections it makes and in the interpretation that changes lives.

The Internet allows us to understand and interpret ourselves differently. Our self is refigured again and again in reflection and relationship to the other. Our world behind the text is understood differently than through traditional means of communication and, in turn, this understanding creates a completely different world in front of the text. Who we are, nationally and individually, changes as we participate in a borderless world

where ideas regarding anything imagined can be accessed and interpreted by all. We can create worlds, cultures and recreate traditions in an attempt to base our understanding of ourselves on understanding others rather than on making judgments based on media and stereotypes. We can create education where developing and transitioning economies may participate in a world market and where learning is free and available to those who wish to learn rather than those who can afford to. Our being, our understanding of ourselves, is transform by an open availability to others, to ideas, to relationships, to a future we create in our understanding of the present and in the fiction possible in our expectation of the future.

From the application perspective, we suggest an approach for transitioning adult distance learning away from the quagmire of technical issues and toward a meta model for adult distance learning that is designed to allow the relationships and life world that is possible with the Internet to enter the educational process.

This recommendation proposes that there is no international model or program that bridges the histories and cultures of the transnational student audience. However, a conversation-based meta model for developing transnational adult distance education and a conversation-based evaluation model can be developed. The meta model, paired with a component- based delivery system, will allow educators across the globe to access, analyze and develop a program that supports learning for students from different nations and cultures with varying access to technology. The planning phase of the model uses theories of human computer interaction and hermeneutic theory related to the language, space, and identity to assist educators in determining approach, content, interface and interaction with different groups of students.

The approach allows for a different kind of understanding and learning to take place than is permitted in the traditional instructor/expert delivery model. In this dynamic model, the instructor steps out of the expert role and focuses on building relationships for learning. Content may include case studies, mock case studies for problem solving, problem solving scenarios or any combination of learning projects and reading determined to best support learning in relationship to the students' needs and expectations. The delivery phase of the model allows curriculum to be delivered across multiple levels of technology, without multiple passes at development. Components allow learning modules to evolve flexible learning environments in a different way that currently exists in packaged learning programs.

If we agree that we exist in reflection and relationship with each other, then the focus of building dynamic adult distance learning becomes how to establish relationships and how to create an environment in which learning can take place. It is in conversation with each other, that we can determine how to create the context for the learning to take the place. The last twenty percent of this process is building the actual courses. We agree there is no transcultural learning model or transnational delivery system. However, through conversation, we can determine how relationships can be built and a context for learning to occur one time, at one place and with

one group of students. This conversation creates a narrative analysis that determines user analysis and interface design, which in turn evolves into a delivery mechanism. For Gadamer (1997), interpretation, understanding, and application allow us to understand a text in terms of the specific situation in which it was written.

In the process of dynamic learning, faculty and students act in relationship with each other. The study focuses on that relationship, as it exists over the Internet, although this is not necessarily a prerequisite. Dynamic learning focuses on the imaginative moment in a relationship where understanding can take place, upon application to the learning context. Application then proceeds to interpretation, whereby the relationship helps to explore how the learning will be used in the real world, in the application. Faculty and students are learning together, working together and solving problems together. They are using the power of language, discourse, text, and the theories behind them in connection with application. They bring to this learning their histories, traditions and possibilities.

IMPLEMENTATION

The Institute for Symbolic Analysis and Development of Information Technologies was established in 1998 by four small IT companies and had no strong financial resources. However, with the support of these companies a small learning centre was established with an infrastructure (computer network and connection to cable Internet). In the January 2000 we started pilot study of digital media online, based on Dynamic Learning. The teachers were volunteers from West Valley College from Silicon Valley who thought several course online.

In the first generation, there were 15 students, although several were not strongly motivated and dropped course after some period of time. Only 30% of students were active participants in the educational process. We were not discouraged with the initial poor results and have since analysed the whole process to find the failures we have made. Our findings were first, that most of the original students were hackers who liked digital media but only at a hacker level and were not prepared for systematic learning, and second, that pure online courses work best for self-motivated students. Fortunately, in 2000 the Institute received a grant from the Slovenian government for Dynamic Learning Development (through the Small Business Development Centre) so we could organize the study of digital media on a more professional level and not repeat mistakes made in the pilot courses.

The most significant change was in the recruiting of students. We promoted the study of digital media and collaborated with the Employment Service of Slovenia. Although most of students were unemployed, with a poor computer science background, they were more motivated than the pilot group. In addition, because the first experience showed it is difficult to organize the learning process online only, we decided to start with Summer School were teachers from West Valley came to Slovenia, and worked with the students face-to-face mode for a month. The main

courses of summer school were Digital Typography, Digital Colours, and Dreamweaver (topics not easy to teach online).
The improvements we made using previous experience gave good results. There was 46 students enrolled in the summer school and 34 completed the course of study. Some important ideas made our summer school successful. First, the formal educational system in Slovenia is authoritative and rigid. Students are usually passive participants in the educational programme; the communication teacher student is usually one-directional. Students learn facts and do not typically have the opportunity to be creative. There is not a lot of teamwork, discussion with teachers and other students, or searching for solutions together. The teachers from Silicon Valley came from environment with an opposite culture. They communicated intensively with students, expected them to be creative and work in teams. Such open, relaxed and creative climate, along with social contact after class resulted in significant changes in students' attitude to the learning process and was one of the most important elements of successful learning for the program.

We continued the Digital Media certificate study at West Valley College with several courses online. Taking in account our experience with Bosnian students, we did not insist on the most modern technologies (hardware and software); our impact was on content and building relationship with students. We found out that email and simple websites with educational materials can work nice even better than using complex e-Learning tools.

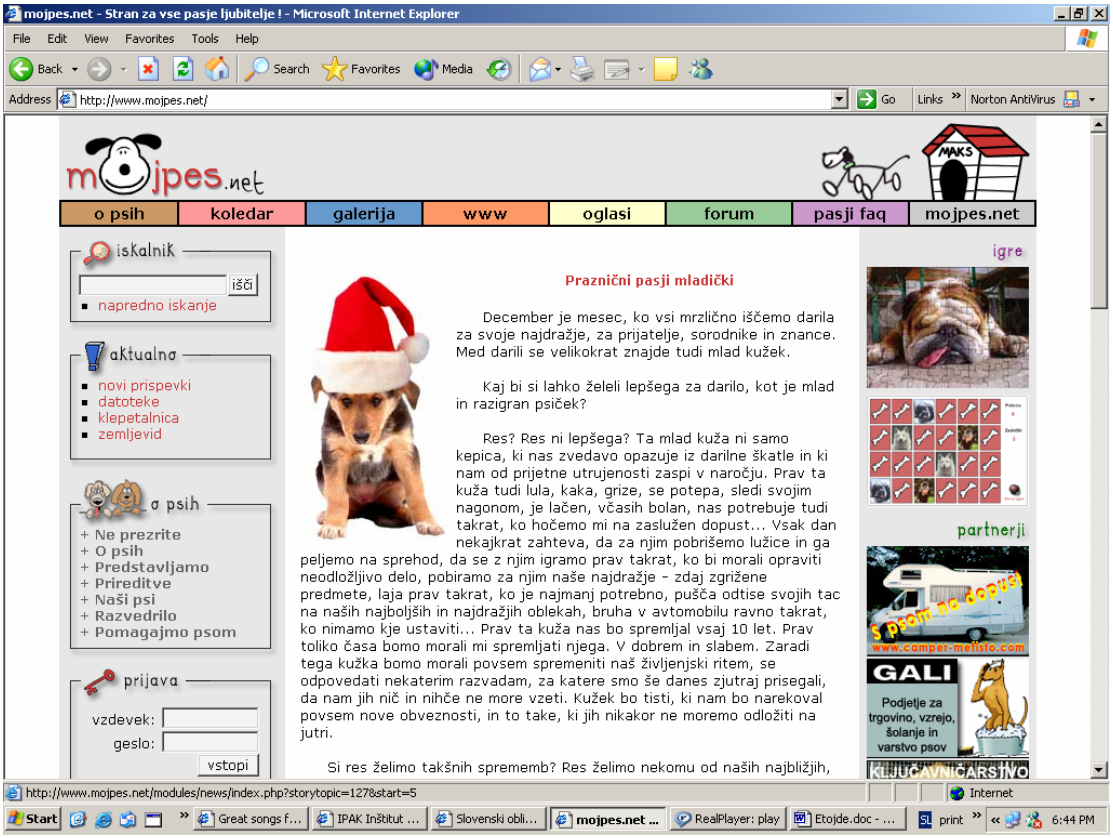
The transition from face to face to online learning was not easy. We had some unexpected problems with the language barrier. During the summer school, the group work and body language made it easier to understand lectures in English than through written documents on web. Another problem was lack of teamwork; during the summer student relationships were formed and students motivated each other. Because they came from almost all parts of Slovenia, it was difficult to maintain these groups and relationships when separated by distance. To avoid these problems, we decided to organize face-to-face meetings with the whole group and help them to resolve above-mentioned problems. At the same time, we recommended they remain active in the forum and help each other online.

Our efforts gave good results; most of the problems were resolved in the first few months of online training. Since most of the students were unemployed, we talked about what we called creating a culture of possibility and taught them how to find jobs and work with clients. The capstone of these efforts was the Digital Portfolio course. In the course students create and realize six projects, four of which must be commercial and web-oriented and the student (photography, painting or a similar field presented digitally) can choose two of which must be presented digitally. This meant that for four projects the students needed to find clients to order a product. The client could be a company, non-profit organization, or even a friend or family member who wanted a website or web application that would be used commercially. Students were required t perform a user analysis before beginning the website development. They needed to understand the client's needs and learn how to communicate and to present their ideas and work. Two of these four commercial projects, in the Digital Portfolio, had to be realized as teamwork of several students. It was difficult to realize this course online because it is not so easy to improve graphic solutions using online communications. However. students did very well and in August 2002 they presented their digital portfolio (to include a digital and hard copy version) in front of an international jury.

PORTFOLIO EXAMPLE

There were 41 participants at the start of the program. A Certificate in Digital media was awarded to 21 students, which is a significantly better

retention rate than in regular study at the Slovenian Universities. There were 15 unemployed persons, who received a certificate. In two years, 12 found jobs, in web design and production. Some became successful web designer. J.P. who previously had serious problems finding a job is now the webmaster at our Institute. As a hobby she created website for dogs in Slovenia, which in four years received one million visitors; a huge number in a country with population of less than 2 million.



my dog website – www.mojpes.net

The next project the Institute realized was an e-Learning course for 40 difficult to employ persons in the framework of the PHARE programme. Based on experience from the previous project we decided to realize the course as a combination of face-to-face and online learning. Once per month we offered face-to-face workshops for students, followed by online activities. We used the forum as an intensive communication tool for faculty to students and for students who helped each other. After nine months of intensive work 29 finished the course and 12 students found a job in the educational period or immediately after.

In developing e-Learning course, we discovered ways to overcome problems in the delivery process. For example, when we taught Computer Process Control at Sarajevo University we found out the course is too theoretical and that students need to learn some practical knowledge by visiting and working for industry. There was a problem in that industry was not operating in the Bosnia after the war and the number of students grew

to the point that we could not invite them to Slovenia for short visits to companies working in advanced process control. When we did find the grants to fund such visits, several companies answered that their staff is too busy to work with students. We decided to develop e-Learning courses based on real industrial cases. To realize this idea we started the project Distance Learning Course in Science and Engineering Using Online Case Studies.

The purpose of the project was to plan, develop, test and evaluate distance learning courses for science and engineering. The courses were based on case studies of technological innovation implemented in various Slovenian companies, near the city of Velenje where the Institute is based. The project was developed under the European Union's Minerva programme, as three-country collaboration between Institute for Symbolic Analysis and Development of Information Technologies, the Centre for Social Innovation in Austria, and Moray College in Scotland. The case studies provide a practical and accessible context for the understanding of more general theoretical ideas. They also provide an insight into technological decision-making in an industrial and commercial context. For the case studies first-hand information and staff time has been provided by the companies because of the involvement if the Institute in encouraging innovation in the Velenje region.

A feature of the format is that it introduces the way in which information is gathered, in a real industrial situation. As such, the background information comes in a variety of forms that vary from one case study to another. The necessary information can be technological, mathematical or, in further cases have more to do with economics or management. In some of the case studies, the information is readily available elsewhere and it is sufficient to provide pointers and references. In others, accessible external sources are more difficult to find and a more substantial body of information is incorporated into the course material. The structure of the courses has been deliberately shaped so that the student not only gathers information, but also develops the skills of information seeking required in real-life situations in industry. The classes address all levels of staff involved in technological decision-making, and particularly those whose task it is to learn first hand how the production processes work in order to seek ways to automate them. Although the material has been developed for use in a distance learning context it can also be used in more traditional course delivery. The full set of case studies form a module that is currently going through the process of higher education accreditation at Moray College, one of the networks of colleges collaborating in the University of the Highlands and Islands project. A major focus in the courses is on computer-aided process control. A general section has been compiled, providing information on the various skills, human as well as technical, required for the procedures of going into a plant to analyse its operation and draw up a model for computer control.

Working on this project, we had several problems that were not easy to resolve. First, although companies were very collaborative, it was not simple to get the materials and content for cases, and it was almost impossible to get experts with time to participate in the online course working with students. Second, at the start we decided to make a lot of

video materials to illustrate the application of computers in the industrial process control. However, transfer technology is still to slow to make this approach efficient. As a result, we reduced the volume of the cases for online courses. Finally, as in many EU projects, the workload and interest of partners were different, so the result was not optimal. In our opinion, and according to our experience, EU projects are more report then result-oriented, and focus on trying to build common EU research and culture rather than direct results. We believe that if we would not realize the project in this framework, we would get better results in a shorter time. However, we found participation in different EU programmes useful, because with some partners we have built long-term relationships and collaboration.

CONCLUSIONS AND IMPLICATIONS FOR PRACTICE

Our experience shows that it is possible to develop and organize e-Learning courses with modest technology and in environment with different levels of economic development.
e-Learning can strongly support education and the transferring of resources between economies. Because 21st century, according to Peter Drucker (Drucker 1996), will be the century of the knowledge-based economy, all countries will have the opportunity of fast development. As Drucker wrote:

> ***"The knowledge society will inevitably become far more competitive than any society we have been yet known – for the simple reason that with the knowledge being universally accessible, there are no excuses for non-performance. There will be no poor countries. There will only be ignorant countries."***

However, e-Learning for the moment cannot improve the creativity, which is, according to Richard Florida (Florida 2002), the ultimate economic source in the modern society. Although our courses made significant changes in the individual lives of students by helping them to increase their employability or find jobs, this does not mean that we succeeded at making significant economic change. There are several reasons for this. First, we were acting in Slovenia, a country in transition proclaiming a free market and entrepreneurship while at the same time making several administrative barriers for starting companies, opening private universities, or building its non-profit, third sector. At the same time, Bosnia remains a country divided between three entities, under the protectorate of EU, and not in the best environment for fast economic development.

The ideas of Dynamic Learning were successfully realized in our courses. However, there is a need for further development from both the androgogical and relationship perspectives. However, we know we created a shared world with our students and partners and that lives changed as a result.

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