

E-learning project

Fish in the Web

The Biology and pathology of
fish



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1 Picture done by Norton B. 1992. used for promotion of Fish Farm - computer simulation of an aquaculture enterprise
<http://science.uniserve.edu.au/newsletter/vol3/montgomery.html>

Introduction

The goal of this work is to present an e-learning project of Fish on the Web – the fish biology and pathology for students of veterinary medicine. This work will cover:

- Framework in which this project has been developed
- Goals
- Methods of production
- Problems that could arise
- For conclusion, I'll try to predict the results based on SECTIONS analysis

Framework

One of the most important factors for each project is framework. I'll describe the basic features of the framework on European, Croatian and the Institutional level.

On the European level e-learning is recognized as one of most important things for the future of the European Educational System¹.

E-learning in Croatia is well supported by Croatian Academic and Research Network; CARNet. All elements essential for development of an e-learning course are available to all academic citizens.

E-learning at the Veterinary faculty. At this moment e-learning is not used at the Veterinary Faculty, University of Zagreb. The only educational media that is widely used is one way face to face teaching enhanced by PowerPoint presentations. For a significant number of subjects there is no literature at all – therefore the students' notebooks are more important technology than books. The same situation is with subject this e-learning project is about.

Quality assurance. There is no any clear quality assurance program used at the Veterinary faculty. Therefore, academic staff is not motivated to make big changes, no matter how easy and beneficial it could be.

The Faculty staff is not familiar with educational theories neither informational nor communicational technologies used in education². As a result over half of the seminars are held as one way (transveristic) lectures.

Lifelong Learning programs. At this moment there are no institutions specialized for LLL programs, although there are such plans.

Faculty management is progress orientated but not familiar with the benefits of e-learning.

Team-based project management approach. Although it is obvious that developing and implementing e-learning effectively cannot be done by professors working on their own³ the project approach is not widely accepted - as it is typical for academic society. Therefore everything that has been done recently was done by a Lone-ranger approach.

Vision and strategy. Clear vision and strategy is not done yet. Although Bates suggests that 'development of vision and strategy is a process that develops context to involve a critical mass of staff in discussion about the benefits and limits of different technologies⁴, this process has not been initiated yet. Fortunately, four departments have started preliminary preparation for e-learning courses.

Faculty Information System (ISVU) was supposed to be implemented last year, but it is not yet and there is no information about it. It suggests that it is not a part of Veterinary faculty strategy, or this strategy is not well done.

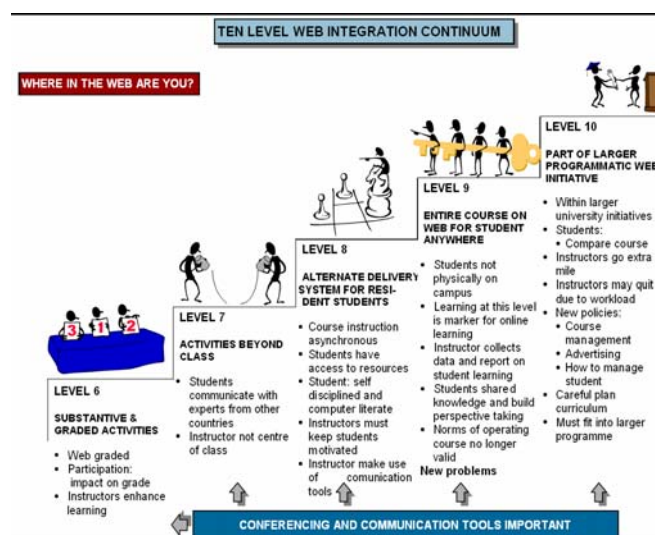
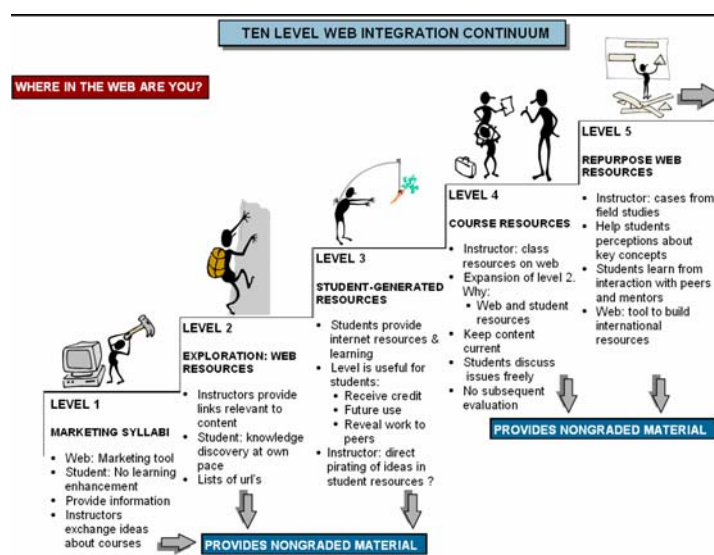
¹ ICT is one of nine Framework Program 7 (FP7) thematic areas for collaborative research with the largest proposed budget of 12.7 billion euro (18€/each person in Europe). Croatia participates in FP7 as full member, so if we will be ambitious as average European nation Croatia with population of 4.8 million can get 84 millions Euros (634 millions kunas). Important thing for future development is that fisheries are also stated as FP7 thematic area – therefore due to the theme of this course it is possible to use it as root for FP7 project in the field of e-learning¹ and/or aquatic organisms.

² Survey done for 1st ELA assignement

³ E-learning Academy, ELA Semester 1 - 2nd Generation, Introduction to Organizational Issues for E-Learning, 1st July 2005.

⁴ Bates A. W (Tony) Managing Technological Change: Strategies for College and University Leaders, CARNet 2004, page 32.

Students' production. At this moment students are producing more educational materials than teaching staff; in digital, same as in printed format. That suggests that Veterinary faculties are, using PowerPoint slides (Irene le Roux and Anne Strehler)¹ that illustrate Web Integration continuum on Level 3 – student generated resources.



¹ Irene le Roux and Anne Strehler, University of Pretoria, Workshop 'Managing the e-learning environment in a Higher Education institution', SRCE, Zagreb, Croatia, 2004.

According to an e-learning continuum and the Zemsky & Massy framework, Veterinary faculty is at the beginning; reaching the border between face to face classroom education and classroom aids (picture).

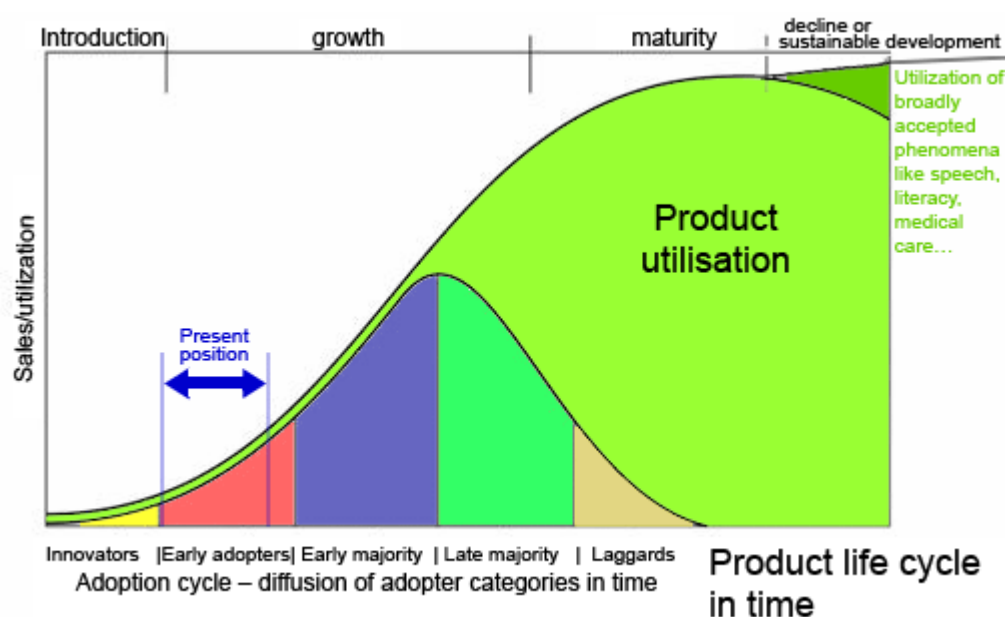


E-learning continuum

Bright future. Fortunately due to strong hardware equipment and excellent support provided by CARNet, the Veterinary faculty has a very good framework to make big progresses by reaching blended learning in undergraduate education and full online education in postgraduate courses. In October 2005 Veterinary faculty will become able to organize a Video-Conference – a facility typical for final stage or E-learning continuum. During October or November Edupoint (CARNet) and Veterinary faculty will mutually organize a conference about e-learning in the Veterinary faculty TeleConference Room. Until that time at the Veterinary faculty one preliminary e-learning course¹ will be done, and teams from three departments will have the basic experience of an e-learning course production.

The Faculty Educational Plan stresses that teaching should be enhanced by e-learning, problem based learning and distance education.

Thus, we are at the beginning, there are only few early adopters^(picture2), but with the equipment we have, in some aspects we are almost at the end.



Utilization of e-learning at Veterinary faculty of University of Zagreb.

¹ Fish in the Web – fish biology and pathology for students of veterinary medicine

Goal

The goal of this project is to:

- Increase the quality of skills students have at the end of education
- Facilitate student usage of all available information and medias
- Enhance teaching staff to use all available technologies and support
- Prepare students for Lifelong Learning
- Prepare teaching staff to teach digital natives¹.

Therefore we should:

- Use a learning centered model during Curriculum Development; the main goal is to gain understanding of the students.
- Prepare materials in a different format; text, video, online WebCT course, PowerPoint enhanced face-to-face teaching, so each student could combine those medias according their preferences
- Use problem based and expert system structures to develop strategies to gradually move students from concrete learning based on personal experience to abstract, reflective learning that they can apply to new contexts and situations².
- Learning objects available in flash format³ should be incorporated in the course.
- Organize seminars⁴ and use them as a place and time where teaching will be done according to the constructivist theory. Students should discuss about real life problems and constructively use all information they get. Teachers should have more of a role as a coach than as a source of information.
- Organize lessons to enhance students' cognitive and metacognitive skills, ability to use and evaluate all data formats, making them as familiar with Learning Management Systems as WebCT.
- Save more time for well prepared practical work
- Define a quality control system
- Establish a web site dedicated to promoting this course to the public, present additional information and act as a meeting point between veterinarians, students, teachers and other experts.

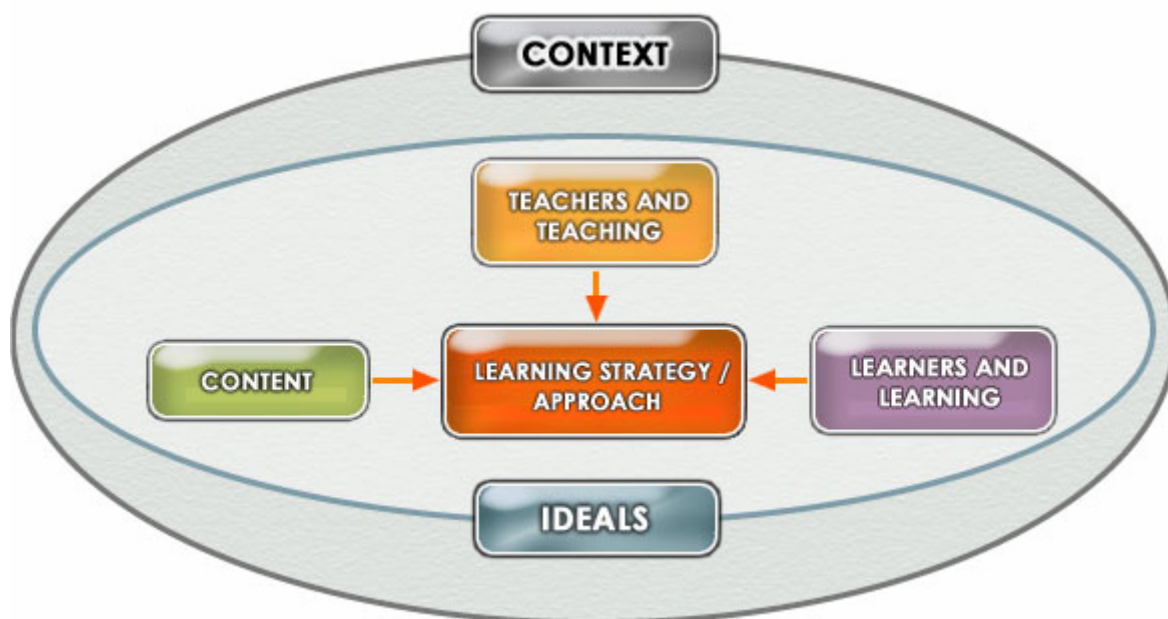
¹ Prensky, M. (2001). "Digital Natives, Digital Immigrants". *On the Horizon* NCB University Press, Vol. 9 No. 5, October.

² Bates and Pole; *Effective Teaching with Technology in Higher Education*, Yossel-bass, 2004, p. 86

³ Prof. Miriz, CD fish pathology, University of North Carolina

⁴ We do not have Seminars. We call it seminars, but we have traditional lessons.

Seminar - a small group of students engaged in original research or intensive study under the guidance of a professor who meets regularly with them to discuss their reports and findings. [www.answers.com]



Factors we have accepted during course development

Methods of production

Methods of production are greatly influenced by the fact that at the Faculty level there is no strategy on how to enhance e-learning utilization, neither quality control nor any other motivation to stimulate production of such a system. So one of the goals of this work is to stress how simple it is to make significant changes; it is the same from the faculty perspective as from the teacher's perspective.

Also veterinary medicine is a practical science and it is important to develop an educational system able to work in situations when computers are not accessible.

Therefore the proposal is as follows:

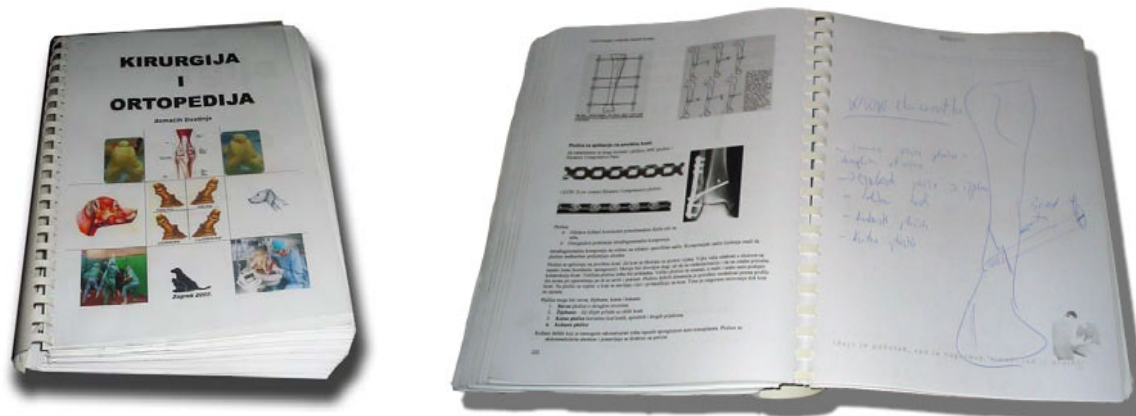
- **Prepare all data about a specific subject in digital format (word document).**

To simplify production:

- i. Text should be done according to our lectures (+ up-to-date literature).
- ii. Content should be well illustrated with pictures from the Internet – of course with respect to copyright. According to my experience 98% of authors will allow usage of their works if they as people or as a website are mentioned as authors with pictures linked to the original page.
- iii. Content in those word documents should be supplemented with an index, dictionary, table of content, reference list and then printed on a color laser printer (5 cent/page = 5€/100 pages). Those pages should be organized so the left side is reserved for content and right (front) side is left blank – for notes so there would be something between book and notebook (workbook).

Benefits of this approach:

- i. It is a notebook so it neither has to be complete nor text has to be perfect. Illustrated guidelines can be very helpful
- ii. It is very flexible – easy to extend, to correct, and to keep up-to-date. Students' comments and questions should be used as guidelines of content development. Although benefit of such a model will be obvious in few months, it is more a process than a product. If authors continue development of content in such an open framework, almost perfect contents will be created in a few years.
- iii. It is cheap; a printed document with 200 colorful pages costs 10€



Example of printed format – Surgery and orthopedics of domestic animals, 2002, 320 pages, students work

- **Video CD** with 4 films (3 hours) will be prepared for students.
- **WebCT course.** Same content as in printed materials enriched by audio/video/flash animations should be available online through the WebCT course.
- **Exams.** Periodical exams will be maintained by WebCT. Every 6th lesson will be held in a computer room. During the first 15 minutes students will have access to the exam. Each student will randomly get questions from the database. Immediately after the exam they will be able to see the results and to compare them with other students' results.
- **Exam rules.** During examination time (15 min) students will have full access to the Internet, with all literature available, and they will have a chance to have an academic discussion. In this case 'Academic discussion' means that students have the possibility to ask questions but only in front of the whole class. If one of their colleagues has the time and knowledge and wishes to answer them they can do so.
Real world environment. These Exam rules are designed to create a real world environment; you have challenges (exam), you have data source - Internet and all literature you can bring, and you have your colleagues. If you have good skills to use those resources you will be successful. The fact is that through such an exam all these skills are objectively evaluated within a very short period of time and it could be very motivating for students.
Metacognitive skills will be enhanced by such an exam and discussions that follow.



Problems

During development of this project problems could arise mostly due to:

- **Motivation.** Faculty management did not establish any strategy to motivate teaching staff to make such changes.
- **Inappropriate teaching style** – if teachers try to carry over the predominant style of the classroom to the new media
- **Project approach.** This project should be completed with clearly defined roles, responsibilities and deadlines which may not be completed in the traditional academic setting.
- **Quality control.** As result of neglecting of project approach, quality control could be insufficient.
- **Strategy** is not clear (non existing).
- **Vision** is not clear (non existing).
- **Education;** teaching staff should acquire up-to-date ICT and pedagogic skills – there could be resistance to such initiative.



Factors That Limit E-Learning Utilization

SECTION analysis

S – Students. A significant number of students are not familiar with computers, and none of them are familiar with e-learning. Although there are over 120 computers in 4 computer rooms, it is very doubtful if they are accessible to students. Good faculty management can change that very rapidly. Fortunately this course has predicted such problems and therefore – in extreme conditions the course can be done 100% computer free.

In the next 3 years we expect that 100% of students will have a computer, and over half of them will have mobile computer devices.

E - Ease of use and reliability. A variety of media will be used in this course, and consequent selection of media according the personal preference will allow easy usage of this course for each student and teacher. A potential problem could arise from the constructivistic theory – a dominant educational theory in this course; neither students nor teachers are familiar with modern educational approaches. Excellent support provided by CARNet makes usage of WebCT simple and accessible.

C – Costs

IT education for teachers' education (Word, FrontPage and WebCT) – CARNet provides such education free for all members of academic society.	70 hours	
Education about elementary educational principles.	6 hours	
Preparing materials (word format)	2 months	4.8 months of work
Designing WebCT course	1 month	
Preparing exams in WebCT	1 month	
Preparing video CD		
- 3 films are done	0	
- one 30 minutes film should be done	1 week	
Preparing and printing/burning CD	0.5h/student → 50 h (week)	
Printed materials	15€/student	Covered by students
WebCT license and support	5€/student	Covered by CARNet
Laser color printer for networks with monthly duty cycle 50.000 – 200.000 pages	2000€	Faculty already have it.

Since we have personnel and equipment, it is not essential to spend more money. Extra investments would be more beneficial for motivation of employees, further education and equipment. Although there are suggestions that teaching with technology creates more work than face-to face teaching in a well managed environment – when the teacher works as part or a team of professionals¹ this will not happen.

Croatian and EU funds dedicated to e-learning are willing to support such initiatives.

T - Teaching and learning. A primary goal of this project is to replace the now mostly used behaviorist approach /transferistic perspective with an up to date, constructivist approach (with elements of social reform). The main motto is "It is not important how many data students hold 2 weeks after the end of lessons; it is important how many problem solving skills they will have in the next five years when they will meet real life problems.

To get the most from it, this teaching will be supported by medias:

- Face-to face contact; Lessons, Seminars – face to face, constructivistic approach (not at this moment),
- Text and graphics
- Video
- Digital multimedia

¹ Bates and Pole; Effective Teaching with Technology in Higher Education, Yossel-bass, 2004, p. 93

I – Interactive. This system will allow much better communication than at this moment between:

- Students and teacher – almost all lesson time will be dedicated to discussions. WebCT course, World Wide Web, Workbook and video CD are important sources. The teachers' role is – through interaction with students – to motivate their study and to enhance their development as problem solving experts. Interaction will be done through face to face and online discussion.
 - Students with students. During lessons and exams, through WebCT course, students will be motivated to work as a team.
 - Students and experts from abroad
 - Students and WebCT course – text, pictures, short videos and exams
 - Students and book/workbook
 - Students and video CD
 - Students and WWW – students will be motivated to use all relevant data they can find on WWW
 - Students and practical tasks – during practical work
- There will be a great improvement compared to when students are mainly passive listeners with not much communication or practical experience.

O - Organizational issues. We have all the equipment we need and excellent support provided by CARNet. The only possible barrier is resistance by teaching staff. Motivate them to leave the dominating position and accepting the challenging student centered approach is critical. Good and long-lasting promotion in cooperation with Edupoints' presentation could allow us to skip that critical point and accept project based planning, team work and pedagogic /e-learning skills as standards. Clear vision and strategy developed by Veterinary faculty could prevent many possible educational problems.

N – Novelty. This technology is completely new for the Croatian veterinarian educational system.

S – Speed. Preparing of such course should not take more then 4.5 months for 1 person. If it would be done as a well organized project with 5 people on a team production would last approximately one month.

Results

Educational system supported by printed materials and e-learning facilities will allow students and teachers:

- not to transfer data from one point to another, but to discuss it,
- not to write down data in notebooks but to search for the most interesting and up-to-date information through the Internet,
- not to have exams as time when you repeat content your teacher lectured a few months ago, but to have an exam as a real challenge, where your skills to find new solutions are subjectively evaluated and compared with your colleagues' results.

As result of this program, during lessons and predicted teaching hours, students will have the chance to see 6 times more pictures, 3 times more data in video formats, and 3 times more text about any subject. To prevent possible overloading, only 30% of materials will be obligatory, so students will manage time and data will be used according their preferences and tasks they will have.

A large part of education will be focused on problem based learning based on real life examples and practical work.

Bates and Pole¹ suggest that 'Those different factors cannot easily be related to one another quantitatively. In the end, an intuitive decision has to be made, but based on careful analysis of the situation.' and therefore it is hard to predict results in numbers.

Although it is hard, I'll do it based on my experience as student, e-learning tutor, teacher and course designer, and in a few years we'll have a chance to prove these predictions.

Results in numbers. At the end of the course students will have, comparing to the present situation, 30-80% more practical experiences. Memorized data will increase slightly (20-30%), but ability to solve real life problems and to manage data will greatly increase (20-200%).

¹ Bates and Pole; Effective Teaching with Technology in Higher Education, Yossel-bass, 2004, p. 78

Life Long Learning. The last but not least benefit of this project is students' familiarity with Learning Management Systems and the constructive education they will get through this program. That skill will be essential for almost all Lifelong learning courses they will attend in their postgraduate carrier.

Conclusion

Information and communication technologies allow big advances in the process of education as well as in the aftermath. To get the best results, education should be a well designed lifelong process based on the practical needs of students.

This project is designed to fulfill that condition. Also it doesn't seek for big investments nor a change in educational systems should be done 'in one day'. Students and teachers can choose the media they prefer (speech, book, notebook, web, video...), and in few years all of them will find benefits of e-learning.

Critical keywords for this project are vision and strategy so we strongly suggest to our senior management to initiate development of such documents ASAP.

Future plans

When we establish this course in the Croatian language, we plan to continue development in the English language in cooperation with at least one faculty (eg. Bari, Italy). For that purpose we will extend courses with the TeleConference Module.

Well designed courses in the English language could allow much better international cooperation, and as result we could initiate international online postgraduate study in fields of aquatic organisms. For such projects we can use Tempus or FP7 budgets.