Veterinary Educational and Collaborative Network

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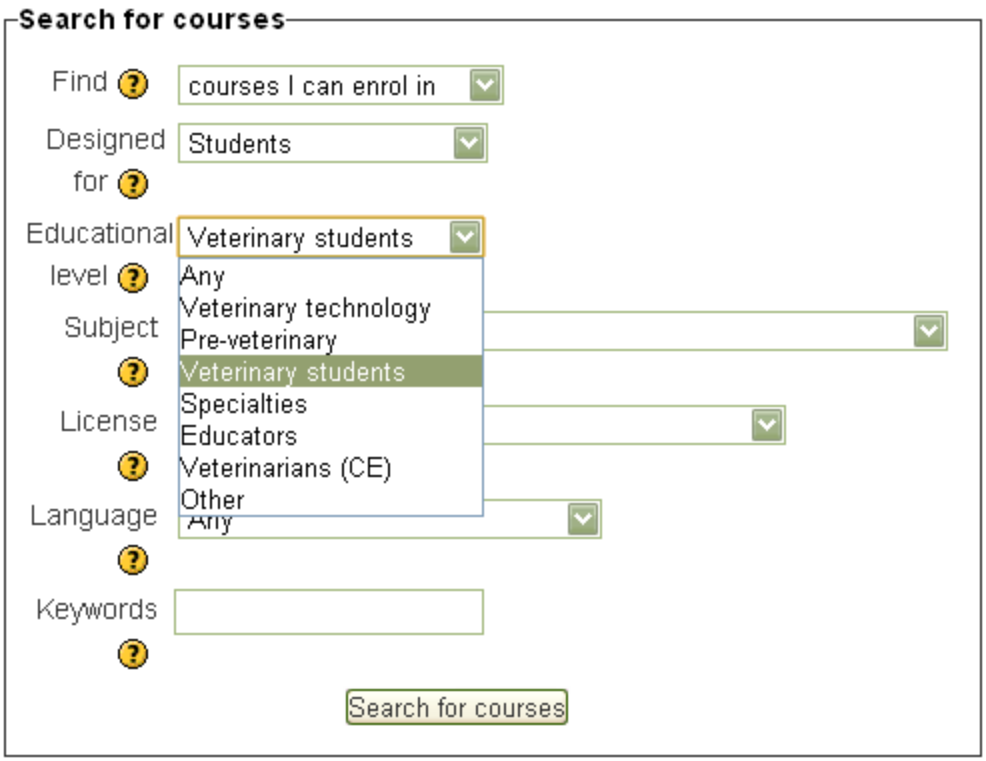


"The best way to predict your future is to create it!"

--Peter Drucker

Example available at:

www.HUB.VetEd.Net

Introduction

Veterinary leaders have been constantly investing in the future of veterinary education. Over the last 30 years, more than seven national studies on the future of veterinary education and many more action plans have been conducted. Those efforts are culminating now with the most comprehensive effort ever undertaken: The North American Veterinary Medical Education Consortium (NAVMEC), launched in 2009, and the action plan the Consortium is preparing.

Greater efficiency and effectiveness. Numerous experts have been stressing the need "*to revisit and reorganize the delivery of veterinary education by making use of new collaborative technology for greater efficiency and effectiveness"* (Bernardo, 2006) and to do so as soon as possible (Eyre, 2010).

Difference! What can make a big difference between previous plans and future ones is that now we have at our disposal the well-developed tools necessary to make it happen.

Customize. With these tools we can build an extremely powerful and customizable collaborative framework. It does not matter if we prefer a flat organization or a more structured one with a strong hierarchy, if we want focus on strong central or dispersed local development; it does not matter which business model we prefer – we can have it all.

Perhaps most importantly, in each part of the network we can have a completely unique set of features – customized specifically for given country, school or even department or course --yet all those unique entities can work together, creating super-productive collaborative network.

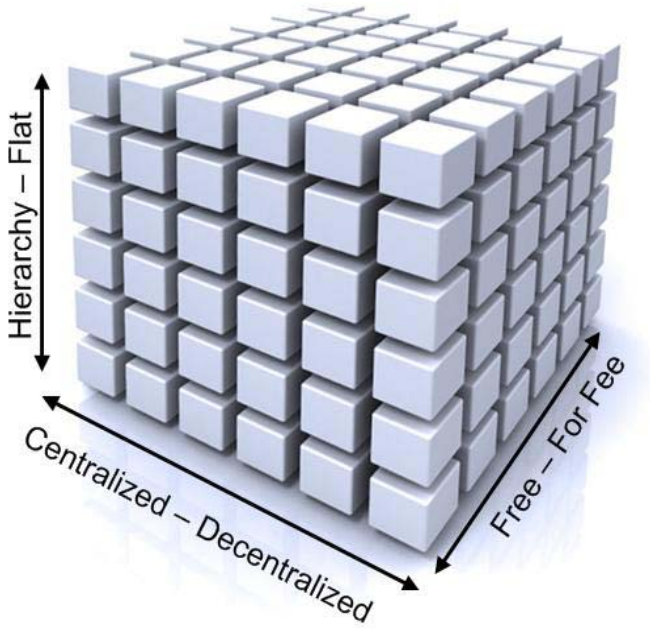


Figure 1. Customizable collaborative framework. Which position is best for your organization? What about your students?

Executive Summary

The time has come. There is a strong consensus that we have to take significant steps "to ensure that veterinary medical education meets the needs of our changing society." The North American Veterinary Medical Education Consortium is preparing an ambitious action plan to make this happen.

Tools to make it happen. While preparing, promoting and producing these important changes, the following tools may be helpful:

- A strong, up-to-date, easy -to-use technological framework;
- Up-to-date collaborative practices that can significantly improve collaboration outcomes while saving time;
- Business models that will make such change sustainable.

Up-to-date models. Researchers suggest that we need up-to-date models to create outstanding results in the Web 2.0 era. We should not rely on traditional business and collaborative models from "the Pre-Web 2.0 Era." Those models were created for the pre-Internet world and cannot deliver the desired results in 2011.

The perfect time to make a change. As veterinary professionals, we—much like our society, our students, our customers and partners — know that change is needed, and everything we need is well-developed and ready to use. As William Gibson so wonderfully noted, "The future is already here; it's just not evenly distributed yet." In our context, that means that all the tools and practices we need have been created; we just need to connect and distribute them in the field of veterinary education.

1) Technological framework.
Four years ago, Dr. Bernardo (2006) wrote:

- *New means of collaborating to organize, share, and impart knowledge are proliferating and will be brought to bear on education, research, and service. We will have the tools at hand; we must also inculcate the necessary behaviors to operate more successfully in the future.*

Today we have those tools at hand. For example:
Community Hub. The new Moodle Learning Management System, Moodle 2.0, comes with the finalized Community Hub Framework. Through this Community Hub, users from all participating institutions can easily find courses or communities of practice of all the partners in their network. It supports a single-sign-on option so students and teachers can roam from one school's Moodle installation to another's (subject to permission, of course). Also, educators from different institutions can collaborate on course development or share course templates.
Central and local management. Moodle and the Community Hub Framework provide a strong environment for local and centralized development and management. Each institution member of the Veterinary Community Hub can have one or more independent Moodle sites and multiple institutions can use the same Moodle installation. Therefore, each institution can join the network without fear that they will lose their sovereignty, yet numerous institutions (with absolute control over their local settings) can collaborate together, creating an extremely productive central organization.
Traditional structure and Web 2.0 options. The Moodle Learning Management System provides a

structured environment where everything can be monitored and controlled. At the same time, Moodle 2.0 is an integral part of the Web 2.0 environment. Therefore, with Moodle 2.0, we can combine the best of both worlds to create a customized combination that will fit all our needs.

ePortfolio and academic social networking. Mahara, an open source ePortfolio and social-networking Web application, already used by a few veterinary schools, is a new addition to the Moodle family. It provides users with tools to create and maintain a digital portfolio of their learning from their very first pre-veterinary course to advanced achievements in their veterinary careers. Mahara also has social-networking features to allow users to interact with each other, with schools, and with employers and recruiters.

2) Practices. Online Collaboration, Openness, Peering, Sharing, and Acting Globally have become recognizable characteristics of global success. Google, Wikipedia, and Facebook on the Internet, and schools, such as Massachusetts Institute of Technology, Harvard and Yale, are among the most well-known examples.

Changing the way we do things is always a challenging task. However, we now have numerous good examples, a big population of users who already employ new practices, and powerful and easy-to-use tools. Finally, it is becoming obvious that with new tools, we can reduce information overload (e.g. 20 e-mails per day), while increasing knowledge production.

3) Business model. The new collaborative world of Web 2.0 is significantly different from the pre-Internet era. Therefore, traditional business models can have only limited success in this environment. The new business model, Freemium[1], has created new economic giants such as Google and Facebook, and is a very useful part of business strategy used by such schools as MIT, Yale, Harvard and Open University.

Freemium and the academic community. Freemium is deeply rooted in the academic community. For example, academics regularly publish their research results – for free. Although academics share the most valuable part of their work for free, premium services, such as teaching, consultancy or grants, can generate significant revenue.

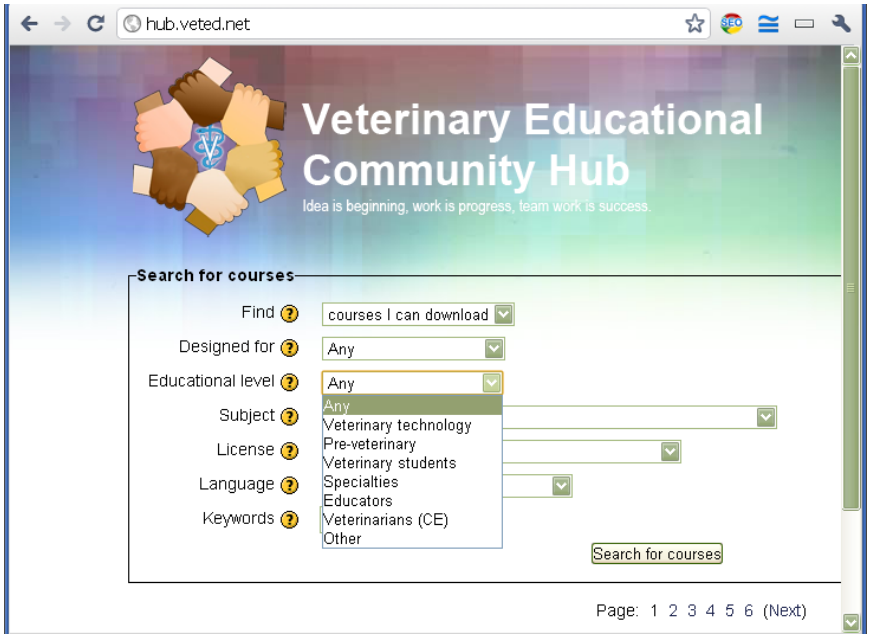
Building momentum around a clear and shared vision, well-planned actions, collaboration and the involvement of stakeholders and leaders at all levels while being innovative, flexible, open and outcome-oriented can significantly increase the success of a project.

Sustainable improvement. To make the changes sustainable, we may consider strategic changes in: the technological framework, the business model, quality control, the organizational structure, partnerships, and administrative and academic procedures.

What is possible now? Two case studies on what is possible now, one from teachers' and another from students' perspectives are presented in the document. A real-life example is available at www.hub.veted.net.

What the Veterinary Community Hub could look like?

[1] **Freemium** is a hybrid business model that combines a free offering with a premium, paid offering (free + premium = Freemium). In addition to premium services, revenue may come from a variety of sources: primary advertising, donations and user-generated value.



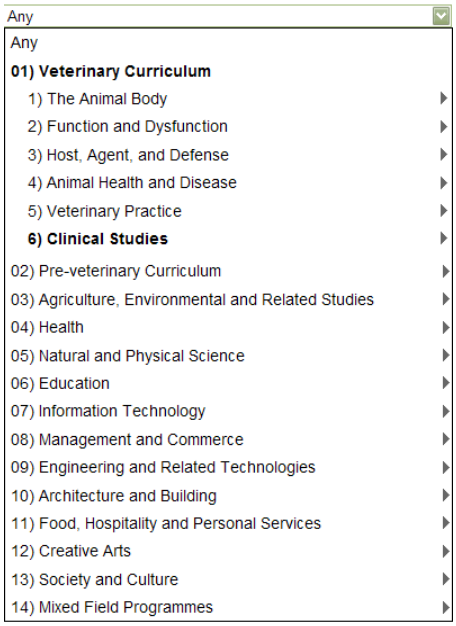


Figure 2. Subject options - can be customized

This example offers the following:

- **Find**: Enroll or Download
- **Designed for**: Students, Teachers or Administrators
- **Educational Level**: Veterinary Technology, Pre-veterinary, Veterinary Students, Specialties, Educators, Continuous Veterinary Education
- **Subject**: Numerous options (check the example to the left)
- **License**: We can search for courses that are licensed in a particular way.
- **Language**
- **Keywords**: We can search for courses containing specific text in the name, description and other database fields.
- **Peer review:** Selected users can review and rate the courses and content.

Goal

The goal is development of an open collaborative veterinary education framework. That framework should provide tools, practices and a business model for self-perpetuating development of Shared Digital Curriculum and Continuous Education products for all categories of veterinary, para-veterinary and pre-veterinary groups.

The framework should be very flexible, so it can provide high-quality support for all aspects of collaboration during execution of the NAVMEC action plan, both on national and local levels, yet very robust to ensure centralized oversight and quality control.

Four ideas of Web 2.0 success. To ensure long-lasting success, constructive mass collaboration, fast development and continuous quality control, the framework should be based on four ideas of Web 2.0 success: Openness, Peering, Sharing, and Acting Globally.

The basic components of the framework should be:

- **Virtual Learning Environment** (VLE/LMS) that supports sharing, selling or renting of courses, collaborative course development, single-sign-in and roaming of users (students, teachers & administrators) from one VLE to another, while letting each school or association have absolute control over their local settings and who is using courses in what way.
- **Social networking and collaborative applications** should support:
    - Development of a dynamic learning veterinary community and sub-communities (regional, subjects, schools . . .)
    - Prompt coordinated actions in case of emergencies like pandemic zoonosis.
- **ePortfolio** system should:
    - Allow students to create and maintain a digital portfolio of their learning, achievements and skills from the first moment when they showed interest in veterinary medicine to advanced skills, rewards or board certification they received long after graduation.
    - Provide teacher with tools to monitor and guide students' intra- and extra-curricular activities.
    - Allow recruiters to look for and attract the most appropriate candidates.

Human component. Because administrators and faculty members willing and skilled to use technologies are a 'must-have' component of such a framework, well-designed educational programs should be prepared for faculty and administrators.

Present Situation

During the last decade numerous authors have been talking about emerging educational tools, their potential and benefits to veterinary medicine (Murray, Sischo, 2007). In the Journal of Veterinary Medical Education, for example, Dr. Theresa M. Bernardo wrote (Bernardo, 2006):

- *New means of collaborating to organize, share, and impart knowledge are proliferating and will be brought to bear on education, research, and service. We will have the tools at hand; we must also inculcate the necessary behaviors to operate more successfully in the future.*

Today, 4 years later:

We have those tools at hand. Learning Management Systems, Personal Learning Environment, Online Video, wikis, and a whole array of online collaborative tools are here. They are more productive, more interactive than ever--and they are used by millions (sometimes hundreds of millions) of users daily. Now teachers can collaborate on course development, share or sell courses to all members of their network. Students can search and enroll in courses or learning communites from different institutions that participate in a network.

Broadband Internet connection has become a standard. Even if you do not have a computer, you probably have a 3G (up to 14.0 Mbit /s[2]) or a 4G (up to 1 Gbit/s[3]) mobile phone. Those phones can be from 250 to 17,000 times faster than a dial-up connection.

Users, schools, society and government are ready. Numerous obstacles that were stopping the changes for a long time are gone.

Computer with Internet connection has become a standard tool for students. For example, the **Veterinary School** of the University of Illinois started incorporating tablet personal computers into the classroom in 2003-2004 (almost 8 years ago!). Furthermore, E-learning has become *an important component of almost every veterinary student's studies in the developed world* (Short et al., 2007), and Web 2.0 technologies, such as Facebook, Wikipedia or Google Apps, has become standard tools for all generations. Nearly 178 million U.S. Internet users watched online video during the December 2009 (Lipsman, 2010) and VIN has more than 42,000 users.

Government. The U.S. Department of Education stated: *There has never been a more pressing need to transform American education and there will never be a better time to act* (Office of Educational Technology, U.S. Department of Education, 2010). The U.S. Department of Agriculture is creating such projects as: Enhancing Food-Safety Education through Shared Teaching Resources (McDonald, 2008).

[2] 14 Mbit /s is 250 times faster than dial-up access using a 56k modem (56 kbit/s)

[3] 1 Gbit/s is 17,850 times faster than dial-up access using a 56k modem (56 kbit/s

Action! And, most importantly, we have started making real, well-planned changes. The Vet ICE idea is a perfect example of a real change.

Therefore, just as Dr. Bernardo wrote, after having those tools at hand:

- *We must also inculcate the necessary behaviors to operate more successfully in the future.*

In doing so, we must know that:

Knowledge is our goal. Information is just one of the tools we can use to nurture knowledge. With the tools we have at hand, we already share data in a fast, safe, and efficient manner, and we can store as much data as we want. We should not waste our time redesigning things we already do very well. Instead, we should use those tools to achieve our main objective ➔ knowledge. Our goal should be the development of practices that will nurture knowledge for all of us. Technology is here. Now we have to "*inculcate the necessary behaviors to operate more successfully";* now we have to use the technology for benefit of our education.

Knowledge and information are two separate entities[4]. Information is a set of data that can be easily transferred from one place to another. Knowledge is expertise and skills to do specific activities. Knowledge cannot be transferred; knowledge should be built. Knowledge-building requires: learning activities, learning objectives, and feedback (preferably human to human communication).

It is not the tool, it is the connection (Frydenberg, Walsh, 2007). Extremely powerful tools that support fast and productive collaboration and education have been in use for at least a few years. Therefore, just as William Gibson noted, "The future is already here; it's just not evenly distributed yet." (Gibson, 2003). In our context, that means all tools and practices we need are created; we just need to connect and distribute them in the field of veterinary education.

It is not about exchanging products, it is about constructive collaboration; it is about process. The era of a product for life is over. Nowadays, courses should be updated at least every few years (Bishop, 2007) and an university degree is just a starting point for lifelong education. Such an ever-changing, ever-progressing environment requires constructive collaboration as standard (Frydenberg, Walsh, 2007).

[4] For example, a 17-year-old young man from India could easily go to a medical library and search on the Web and find all the information ever produced about an adenoidectomy. However, because he does not have enough knowledge to understand the information, and because there are no clear learning objectives and feedback mechanism, even all that data will not be enough to make him skilled enough to do adenoidectomy.

Technological Framework

[Moodle – a free[5] open source Learning Management System with more than 50 percent of world market share is used as a LMS of choice for this project proposal. Moodle is already endorsed as LMS of choice for Veterinary Internet Content Exchange. Commercial solutions with almost the same features (Blackboard) are available.]

Moodle 2.0 and Community Hubs

A new Moodle Learning Management System (Moodle 2.0, 2010) now comes with the finalized Community Hub Framework (Moodle.org, Development:Community hub, 2010). Through such hubs, users from all participating institutions (each can have one or more independent Moodle sites and more institutions can use the same Moodle installation) can easily find courses or communities of practice from partners in their network. Educators from different institutions can collaborate on course development or share course templates.

Community hub framework supports a range of scenarios such as courses that are public or private, free or paid. Therefore the community hub supports the following scenario:

Veterinary School Consortium

A group of seven veterinary schools and one non-profit professional veterinary association can share courses among themselves. Some courses are free for students and for others, students must pay. The consortium has 25 fee courses for continual education of veterinarians. In partnership with animal science professionals, the consortium is developing interactive educational programs for pre-vet students, pet care providers and veterinary paraprofessionals. In addition, the consortium has numerous communities of practice through which students, faculty and veterinarians can discuss, research and learn about specific topics.

If a teacher is creating a course "Parasitology 1," he will be able to:

- **Easy Start**. Read reviews and ratings of courses and download the most appropriate template or specific activity in the course.
- **Team work**. Look for the parasitology community inside the consortium and participate in its forum discussions, wikis, chats, Web-conferences, development of educational materials . . . She will also be able to invite colleagues to check his course and, with permission, import specific content or activity from colleagues' courses.
- **Collaboration**. If she wants to share her course with colleagues in the consortium, she can just click on the "Community button" and the course or part of that course will be "pushed" to a

[5] According to my experience, the only disadvantage of Moodle compared to the expensive rival Blackboard is that it is free. It is human psychology:

- After paying a price in the 6 or 7 digits (Bradford et all, 2007) for a commercial license, decision-makers will do everything they can to make good return on that strategic investment (RoI). They will not hesitate to pay for high-quality support services, instructional designers, staff education and everything else that will make their LMS work better.
- However, if the license costs nothing, decision-makers may hesitate to spend money on support services and hosting. Furthermore, because there is not big strategic investment, quality control mechanism may not be established.

central repository, so that other teachers all over the consortium can browse and use the information (for fee or free of charge).

- **Revenue**. When his course is done, she can:
  - Sell a license or teach students from other schools (for a fee).
  - Rent a course: let teachers from other schools use the course on her school's server.
  - Publish the course as an Open Educational Resource to promote herself, her program or her school, and receive financial reward as part of a grant-supported OpenLearn initiative.
  - Let her colleagues use and improve the course, creating a newer, better and more versatile course while she is still the main author.

The diagram below shows the basic structure:

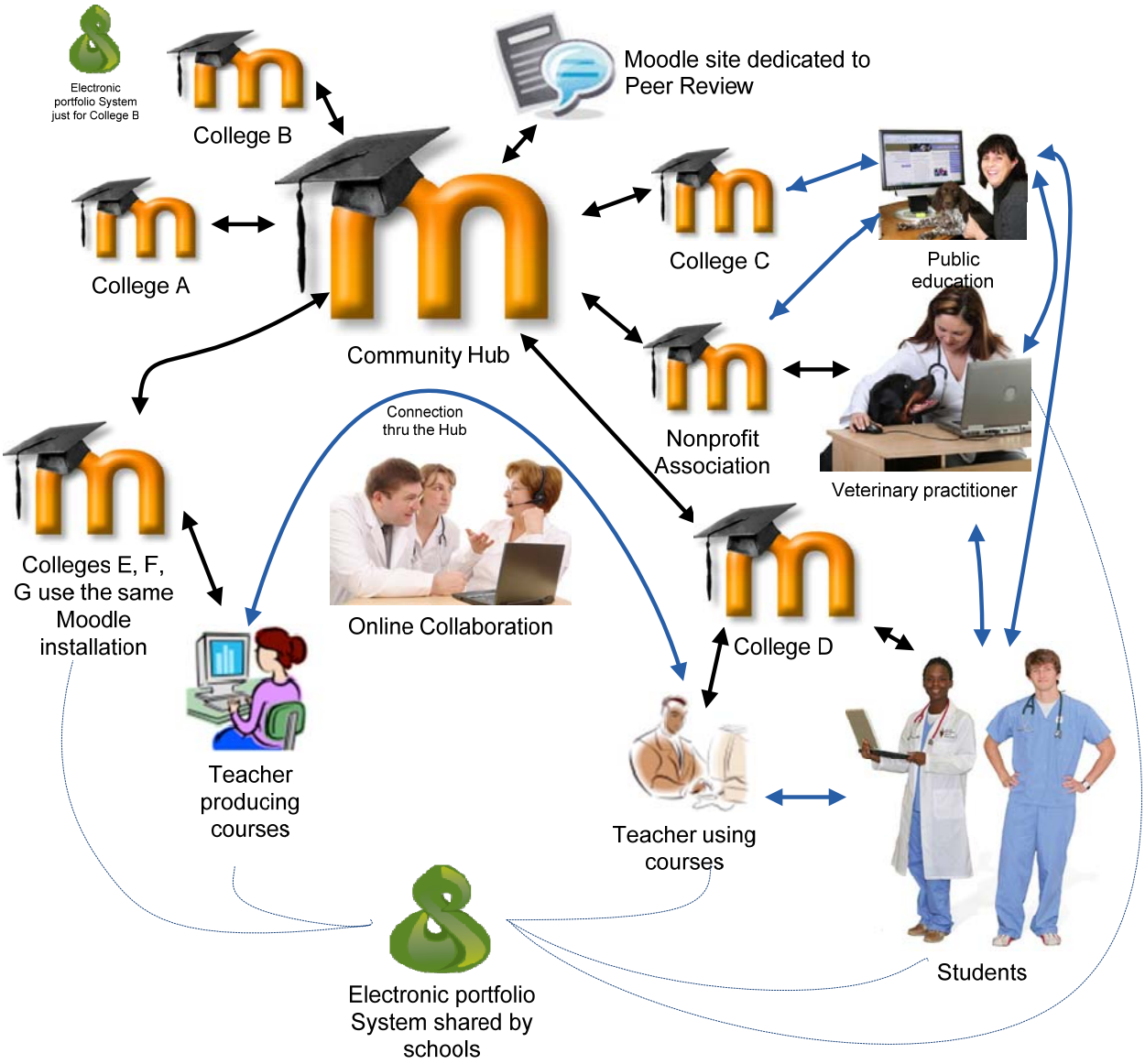


Figure 3. Community hub architecture.

- Colleges A, B, C, D and nonprofit association have independent Moodle installations
- Colleges E, F and G share the same Moodle installation
- Faculty and members /staff from NonProfit Association are collaborating on development of learning activities for veterinary practitioners
- Faculty, students and veterinary practitioners are collaborating in development and delivery of public education programs like myhorseuniversity.com (University of Michigan) and healtypet.com (AAHA) and pre-vet programs intended to prepare and recruit a diverse population of the best students.
- College B has an independent Mahara ePortfolio system and
- Colleges E, F, G, D and Nonprofit Association share a same Mahara ePortfolio system.
- The Moodle site dedicated to Peer Review has separate reviewing/working rooms equipped with all forms and other tools essential for individual/anonymous review or collaborative feedback.

Moodle 2.0 - an Integral Part of Web 2.0

Moodle Learning Management System (LMS) provides a structured environment in which a teacher makes decisions on how, when and what will be learned while everything can be monitored and controlled. However, Moodle 2.0 is developed as an integral part of the Web 2.0 environment. Moodle now supports integration with external repositories of content such as Alfresco, Amazon S3, Box.net, File system on Server, Flickr, Google Docs, Mahara, MERLOT, Picasa, Remote Moodle sites, WebDAV servers, Wikimedia, YouTube, and with external Blogs and Google Application (Moodle.org, Repository Support, 2010).

Mahara, an open source ePortfolio and social-networking Web application already used by a few veterinary schools is a new addition to the Moodle family. It provides users with tools to create and maintain a digital portfolio of their learning since their first pre-veterinary courses to advanced achievements in their veterinary careers. Mahara also has social-networking features so users can interact with each other, school, employers and recruiters. Mahara can be fully integrated with a Moodle single-sign-on system. Therefore, we can have one Mahara installation per each school, or all institutions can share the same Mahara installation.

In addition to reflective learning and social networking, Mahara provides teachers with tools to monitor and guide students' intra- and extra-curricular activities. Also, with Mahara, recruiters can look for and attract the most appropriate candidates and project leaders to be the most suitable partners.

Personal Learning Environment

LMS and PLE. Moodle's flexibility, networking capability and possibility to integrate with almost all major Web 2.0 applications is a strong framework for a Personal Learning Environment (PLE). Personal Learning Environment is a concept different than LMS. It is almost 100 percent in control of a student. A student makes decisions on when, how and what will be learned; a student creates new content and new value.
Perfect combination. Although different, LMS and PLE make a perfect combination. They provide us with the possibility to combine well-structured, well-guided educational activities in a Moodle course with the benefits of a Personal Learning Environment and Web 2.0.

Super-productive Vet 2.0. PLE and Web 2.0 is a framework that supports "*mass contribution model: a state wherein we all play a role in both creating and consuming everything*" (Hodgins, 2007). Such mass contribution model my help us achieve "the immense scale that future learning demands."

[*Since Moodle 2.0 is much more than a Learning Management System (as it was during Web 1.0), the term Virtual Learning Environment is used more and more* (Jandrić, 2008).]

Administrative and Academic Procedures

We have tools to do all we need, broadband Internet, and a majority of users ready for a change. That is a good starting point. However, intensive constructive collaboration and development of educational and collaborative network requires a whole array of tasks administrators will face. The most important tasks are (MacKeogh, Fox, 2009):

- Flexible modular frameworks that will support collaboration. Moodle is an ideal tool for such a task. It is extremely powerful, easy to administer and use, and it is free. Therefore, each institution can have its own Moodle installation, while being able to actively collaborate with all members of the network. Besides Moodle, we need a trained system administrator, instructional designers and support staff.
- Innovative pedagogical approaches appropriate for online education. Because faculty acceptance of online instruction and collaboration is usually the key issue (Allen, Seaman, 2007), introduction of such approaches should be very well-planned.
- New forms of assessments linked to learning outcomes, including e-portfolios
- Cross-institutional accreditation and credit transfer agreements
- Inter- and intra-institutional collaboration in development and delivery
- Multiple access and exit points from programs
- Commitment to equivalence of access for students on and off-campus

Proper management of the aforementioned tasks requires (MacKeogh, Fox, 2009):

- A clear vision of desired outcome (i.e. collaboration, shared digital curriculum, ubiquitous, lifelong access to veterinary education);
- An understanding of the current capacity and attitudes of the relevant staff and
- A coherent set of steps to move from the current situation to the desired outcome.

Three crucial steps are:

- Training and awareness promotion. Lack of awareness of the potential and quality that online collaboration and education can achieve can be a major obstacle. The same thing will happen if sufficient in-house expertise is missing
- Funding flagship programs
- Clarify ownership and usage rights of intellectual property generated for teaching

Intellectual Property

Properly managed copyright ownership and licensing rights are essential tools to stimulate, reward and recognize faculty to develop innovative educational activities. If such rights are not properly managed, they could become a major obstacle.

Challenge 1. Intellectual property created at a university can be extremely valuable. Therefore, sometimes teachers and students are not willing to share that data. For many faculty members, this is unacceptable because it is completely opposite to traditions of education as a public service. Therefore, we will probably face this challenge only sporadically.

Challenge 2. Traditionally, faculty and administrators both resist creating project-specific written agreements. Without a written agreement, the copyright law states that all contributing authors are "joint owners" or "owners in common." (Donohue, Howe-Steiger, 2007). Such a situation can cause painful tensions, enormous litigation expenses and, in the end, can permanently discourage future courseware development.

Challenge 3. Choosing an appropriate copyright model. There are three basic copyright models (Donohue, Howe-Steiger, 2007):

- Faculty-owns-the-copyright model
- University-owns-the-copyright or work-for-hire model
- Collaborative ownership model

Traditionally used are the first two modes: Faculty-owns-the-copyright and university-owns-the-copyright. From the administrator's perspective, they are simple, easy-to-use models that have long tradition.

New. The model of choice now would seem to be the collaborative ownership model, though it requires the "soft" analysis of relative contributions and takes the most time to develop (negotiation of incentives, rights, and other expectations).

Donohue and Howe-Steiger found that *sharing rights keeps the cost of curriculum development down, allows each party to do everything with the courseware that they might want to do, and attracts excellent academic and private-sector experts to e-learning projects* (Donohue, Howe-Steiger, 2007).

Collaborative ownership model addresses unique e-learning issues such as collaboration between groups from different institutions, different experts (content expert, instructional designer, web developer . . .), content updating and maintenance, financial incentives and royalties from distribution of e-learning courses.

Creative Commons

Make it simple. Numerous authors argue that the existing copyright system, created during pre-digital age, cannot work in the digital age (Lessig, 2010). The Creative Commons licensing system is created as an answer for that challenge. It provides simple ways for authors to mark their content with the freedoms they intend their content to carry.

Top universities such as Harvard, Yale and MIT are intensively using Creative Commons licenses for their OpenCourseWare activities.

It would be very beneficial if all administrators and faculty would become familiar with the Creative Commons framework and a few positive examples.

More about the Creative Commons licensing system is available at http://creativecommons.org/.

Coopetition

Collaborative education supports team work in which everybody participates equally. However, it is also an excellent environment to promote areas where we are the most competitive experts. That is why we should mention coopetition.

Coopetition is a neologism for collaborative competition. It happens when schools work together on projects where they do not believe they have competitive advantage and where they can share common costs. In other areas schools may remain highly competitive. For this system to work properly, schools need to define where they are working together and where they are competing (Wikipedia, 2010).
For example, a group of veterinary schools can work together on undergraduate veterinary parasitology course while remaining highly competitive in the area of postgraduate parasitology education and research.

Quality Control

Maintaining quality starts with defining a purpose (mission), desired results in a 1- to 5-year period (vision), actions we will do to achieve those results (strategy) and constant assessment of progress.
In an environment where informational and communicational technologies and practices create "rapid, profound, unpredictable, and likely discontinuous" changes (Duderstadt, 2001), quality has become a "moving target" (Moore, Maintaining Quality in Online Education, 2007).

In such an ever-changing environment, quality control can be based on:

1. Well-designed internal continuous quality-control framework and
2. Benchmarking

Continuous Quality Improvement

The Sloan Consortium, an institutional and professional leadership organization dedicated to integrating online education into the mainstream of higher education, has created an elaborated Continuous Quality Improvement (CQI) framework.

The five pillars of the Continuous Quality Improvement (CQI) framework are (Moore, Maintaining Quality in Online Education, 2007):

1. Learning effectiveness,
2. Institutional commitment and cost effectiveness,
3. Access,
4. Faculty satisfaction,
5. Student satisfaction

A detailed description of the Sloan Consortium Quality Framework and tools they use to evaluate each of the Five Pillars is available at (Moore, The Sloan Consortium Quality Framework And The Five Pillars, 2005): http://www.sloan-c.org/publications/books/qualityframework.pdf

Figure 4. Five Pillars of Quality. Source: sloan-c.org

E-moderators – the key quality factor. Research shows that the most critical success factors of online courses are "*skills, effort and guidance of the subject experts who moderate each course*." Therefore, selecting, training, benchmarking, and supporting good e-moderators (online tutors/mentors) should be one of the top priorities (Short et al., 2007).

Benchmarking

Benchmarking is methodology used to improve performance by finding high-performing organizations and importing their practices to the home organization (Keehly, Abercrombie, 2008).

Nowadays, when we define quality as a "moving target" that should be monitored and improved daily and when we have tools to create a highly interactive network of veterinary educators, solution-driven benchmarking is the method of choice.

The essence of the method is the network of professionals and organizations that the benchmarker can tap for promising practices.

Five Steps of the Solution-Driven Benchmarking Method are:

1. Discover the challenge
2. Establish criteria for solution
3. Search promising practices
4. Implement promising practices
5. Monitor progress

Networks and community of practice created/supported by Moodle community hubs and Mahara can significantly ease and accelerate the benchmarking process.

Sloan Consortium is an organization we can use as a benchmark and its Effective Practices Site is a good example we can import in the veterinary education community.

Sloan Consortium Effective Practices Site is available at: sloanconsortium.org/effective.

Universitas 21. Another good benchmark partner may be Universitas 21. It is an international network of 21 leading research-intensive universities in 13 countries (650,000 students, more than 130,000 staff members and more than 2 million alumni). Sharing good practice and benchmarking activity is one of the key goals of its strategic plan (2007-2012): www.universitas21.com/StrategicPlan.pdf.

Peer-reviews (accuracy) and feedback generated by students (ease of use and understanding) can play significant roles both in continuous quality improvement and in benchmarking (Bernardo, 2007). Both peer –review and feedback generated by students provide very valuable information. Because these are two different types of information, it is better to use both instead of relying on one type.

Moodle Comments Block. In addition to the Community Hub Framework, new Moodle 2.0 comes with a Comments Block. The comments block allows comments to be added to any page and any activity. Comments can be public or visible just to teachers (and/or administrators). With that feature each user can become a reviewer; each user can add value to a course.

It is possible to create comments blocks just for reviewers.

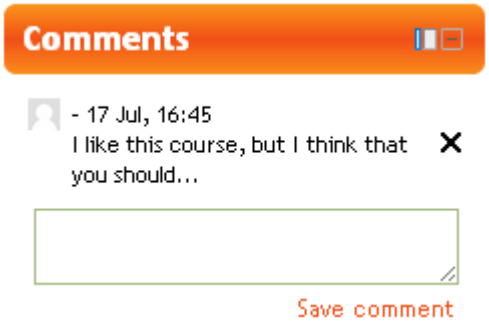


Figure 5. Moodle Comments Block

Business Model

Traditional Business Models?

Christensen, Aaron and Clark concluded that the economic failure of numerous online programs is caused by wrong business models. More often than not we were using traditional business models that are not suitable for up-to-date technology-supported collaboration and education. Therefore, they suggested, *we should develop a business model that turns relative weaknesses of online collaboration and education (compared to the incumbent) into strengths* (Christensen, Aaron, Clark, 2001).

New Business Model – The Model of Success

Today, 9 years later, it is obvious that all new super-successful Internet enterprises such as Google, Wikipedia or Facebook became huge hits because of a new business model called Freemium.
Freemium is a hybrid business model that combines a free offering with a premium, paid offering (free + premium = freemium). In addition to premium services, revenue may come from a variety of sources: primary advertising, donations and user-generated value.
For example, G-mail, Google applications, Facebook (Yahoo, Flickr . . .) are free services. However, if you want more space for your Google documents, more visible Facebook page for your company or you want to advertise using Google, Facebook or Yahoo, those are premium services and you'll have to pay for them.
User-generated value. Value created by users is the key component of Freemium's success (Piller, 2008). Users are the engine that creates "viral marketing." Users are the main content creators (TeacherTube, Wikipedia, Facebook . . .), and search engines, such as Google and Yahoo, categorize and rank Web pages mainly based on data received by tracking users' activities.

Freemium in education is another success story. If you go to the Web site of the Massachusetts Institute of Technology (ranked as the 5th best university in the U.S.), you will be able to reach almost 1,900 courses online[6] – for free. However, if you want to talk with faculty or get a degree, those premium services require payment. Similar setups can be found on the Web sites of Harvard[7] or Yale[8] (ranked top two in the world).

> One of the first descriptions of Freemium in higher education dates from 2005 when Herwig Rollett et al. discussed *"business models for resource sharing between larger institutions of higher education, where revenue streams will typically result not so much from an application service provider offering but instead from particular value-added services"* (How to Provide One Stop Shop eLearning? A Real World Business Model, 2005).

OpenCourseWare. MIT, Harvard, Yale and many other universities are providing free course content online as OpenCourseWare.
OpenCourseWare consists of educational materials created by universities and shared freely with the world via the Internet.

[6] MIT OpenCourseWare: http://ocw.mit.edu
[7] Harvard Open courseware Initiative: http://mycourses.med.harvard.edu/public/
[8] Open Yale courses: http://oyc.yale.edu/

Freemium is deeply rooted in the academic community. For example, academics regularly publish results of their researches in scientific magazines -- for free. Despite the fact that they share the most valuable part of their work for free, their premium services such as teaching, consultancy, and support received by donations/grants can generate significant revenue.

History. The OpenCourseWare idea was initiated in 1999 when the University of Tübingen in Germany published videos of lectures online. OpenCourseWare became globally important when MIT launched it in October 2002.

OpenCourseWare providers experience these benefits:

- **Brand** recognition will be improved.
- **Donations**. Because open courseware is for the benefit of society, it attract donors. The vast majority of OpenCourseWare is funded by donations.
- **Program improvement**. Site statistics can show how many users are from a specific country/region/town/university, and whether they are just browsing or using the material for schooling. All of this data can be extremely beneficial for planning globally recognized educational programs.
- **Savings**. After courses are published, administration costs are lower. Because all content is freely available, there is no need for special users' accounts, licenses . . . Furthermore, administrative problems such as not being able to access content from a previous year does not affect premium students. An Open Courseware Consortium PowerPoint presentation (Opencourseware Consortium, 2008) summarizes that advantage with this sentence: *Benefit learners without impacting your schedule.*
- **Network**. Open courseware will attract numerous experts willing to collaborate.
- **Participate in something bigger than your university**. The consortium PowerPoint presentation stresses these key advantages: *Showcase excellent work to a vast group. Make your work a pillar for others to build on and leave an academic legacy for others long after your time*.

OpenCourseWare 1.0. Because OpenCourseWare started before the success of Google (incorporated 1998), Wikipedia (2001), Facebook (2004) and, most importantly, before the Moodle Community Hubs Framework was finalised (2010), it has been focused on sharing things the way it was done in the pre-Web 2.0 environment. It did not fully exploit the use of the Internet's network capacity and, therefore, it has been using more traditional market logic (Hoppe & Breitner, 2004).

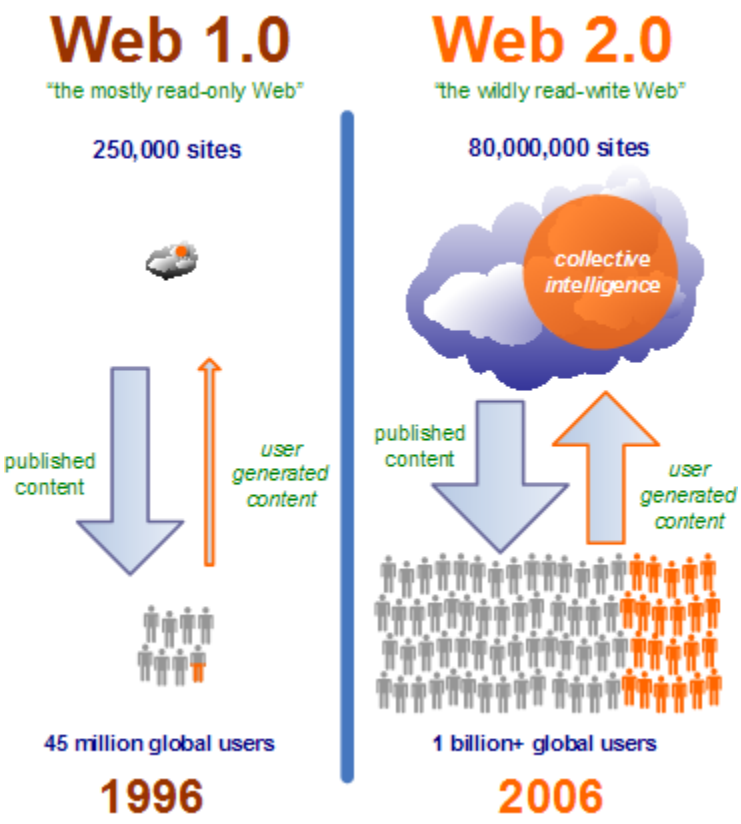


Figure 6. Web 1.0 vs. Web 2.0. Basic differences. By: PopoEver 2006

OpenCourseWare 2.0. Now, during the Web 2.0 era, merely sharing content is not good enough. For example, Hewlett Foundation, one of the biggest OpenCourseWare supporters, noted that it wanted to focus on a main goal: *"increase access to knowledge for all and improve the practices of teaching and learning*" (Hafner, 2010). That was a nice way to say that text, pictures and video online is not good enough – not any more.

Collaboration 2.0. With requirements for OpenCourseWare 2.0 comes the question: How we will create and maintain it?

Super-productive learning community. Probably the most important difference between the beginning and the end of this decade is that now we have tools not just to share content, but to actively collaborate 24/7 and share educational activities. Through such collaboration we can "*increase access to knowledge for all and improve the practices of teaching and learning.*" With the tools we have and the creative potential of all – faculty, staff, students, veterinary practitioners and public – a super-productive learning community can be developed

Freemium – Options and Potential

Free of charge or paid. Before we continue discussing Freemium, it is important to note that we have numerous options to configure our system to fit our needs. We have variety of schools/associations, countries, user groups, sponsors, courses, donors. For each of them we – as a community or as individual authors - can customize what will be free and what will be premium value-added service. In addition to that, revenue sources like grants, donations and sponsorships can be an important part of the business plan.

Benefits of being free of charge. Having content and online activities for free brings benefits:

- Promotion of premium services. For example, Open University (The Open University Council, 2010) whose free online content influenced at least 11,000 students to register for premium courses.
- Value generated by users: content, tags, reviews, promotion.
- Viral and traditional advertising.
- Donations

How can it be free? Through history, prices of books or other educational materials were based on three elements:

- Production costs
- Scarcity
- Conditions of access to content or service

Nowadays, information can be reproduced and distributed at nearly no cost; scarcity has become abundance.
The only important cost factor left is production cost. However, in the environment where thousands or millions of users can simultaneously use the same product, proportion of production cost compared with market share is very low. Furthermore, thousands of users are eager to collaborate on product development. WikiVet.Net , Wikipedia and TeacherTube are just a few examples.

Freemium revenue models? Chris Anderson talks (and illustrates) about 4 ways we can generate revenue by Freemium – four different kinds of free (Anderson, 2008).

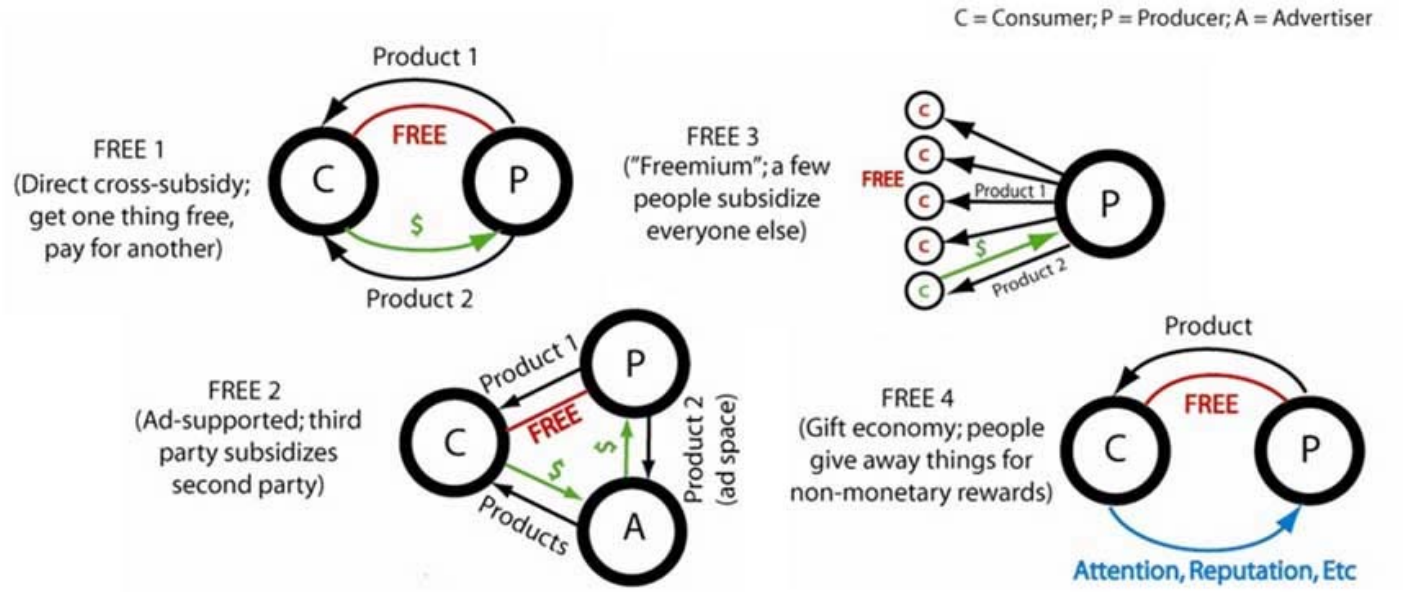


Figure 7. Four different kinds of free. Source: Freemium.org

Which of those 4 Freemium modes is the best for a veterinary learning consortium?

It seems that we can use all four of them:

Free 1. Get one thing free and pay for another is a model well-tested in MIT's example. Everybody can get courseware for free. Tuition fees, however, are required for additional features. In our example, we can have access to part or whole course materials and activities for free, but courses with mentors and peers can require a fee.
www.Freemium.org explains it: *When the supply of a product increases, the demand for its complimentary products increases* (Freemium.org, 2008). Therefore, if we increase the supply of educational materials and activities, the demand for products such as mentored educational activities, credits, additional materials and privacy will increase.

Free 2. Ad-supported. Online learning communities represent well-educated, specialized groups of people who are spending a significant amount of time collaborating (improving their skills and habits) online. This is an excellent opportunity to do market research or to promote products.

Free 3. A few people subsidize everyone else. Revenue generated from premium services or donations can cover costs. Premium services may include: additional support in mentoring, additional materials, statistical data about users preferences. In the example of the OpenCourseWare Consortium, nonprofit foundations, as main donors, were paying costs for everyone else.

Free 4. People giving away things for non-monetary rewards can be a significant source, starting with content experts (and course developers, practitioners, students . . .) who would be willing to donate their courses, content or expertise through philanthropic associations to corporate and government grants.

Can Freemium in e-education make an improvement?

Potential! In aforementioned examples, we saw that the Freemium business model can combine the best characteristics from commercial and free-content sharing models and online groups. It can:

- Drastically increase users' population
- Provide significant revenue
- Maximize exponential advertising potential
- Develop a strong community that will support further development, quality control and marketing (viral marketing–word of mouth)

Conclusion.The Freemium business model is used by the world's leading universities (members of OpenCourseWare Consortium) and has generated some of the most successful economics and social phenomena such as Google, Facebook and Flickr. There are numerous positive examples of Freemium in the educational environment and the recent Web 2.0 and eLearning 2.0 booms have helped successful Freemium startups. Therefore, the question is not if we can use the Freemium model to develop and market online courses. The question is when will we do it? Will we be at the forefront or will we be laggards? Will we have a well-done plan or will we wait for change to happen somewhere else?

RoI

Costs. Technological change comes with many fixed and variable costs. All costs as well should be made as transparent as possible and entered into the model (Bates, 2000).

Largest area of expense. Research shows that labor (e.g., faculty, Instructional designers, Web designers), not information technology, constitutes the largest area of expense in online learning costs (Johnstone S, Poulin R., 2002). That is even more true now when all teachers and students already have computers (or mobile phones) with broadband Internet access.

Moodle. Therefore, the cost of hosting Moodle LMS is the main hardware and software expense. Cost per student can range from $1 a year to $20 a year, depending on whether in-house hosting or an outside service is used.

Cost of labor for support services such as help-desk, instructional designers, faculty education and administrative services will be the main cost of this project. Most schools already have support services, so the cost will depend greatly on how well we manage resources that we are already using.

Context. This project has multiple objectives (new products, cost-reduction, collaboration, quality improvement, new markets, CE) and it is hard to quantify cost of labor. Instead of examining Return on Investment from a merely financial perspective, we may find it more helpful to use a framework in which the elements are contextualized and linked to organization goals (Bishop, 2007).

Better ROI. One 'contextualized perspective' states that with this project we will do all things we are supposed to do in the second decade of the 21st Century but we will do it together. In that case, there is no doubt:

- ***Collaboration across veterinary colleges to develop and/or share resources, experiences and educational activates will provide a better return on investment and more efficient use of faculty time*** (Jean-Michel et al., 2007).

In other words, instead of creating '*28 different versions of virtually the same material, all aimed at training and educating the 2,400 U.S. graduates who enter the veterinary profession each year'* (Murray, Sischo, 2007), we can collaborate on development of fewer but better versions while saving money (improving RoI).

Organizational Structure

Organizational structure depends on products developed, technology used, skills and attitude of employees and users of the product. Because all of this is still evolving, the organizational structure may be a work in progress with a focus on effective decision-making across the whole institution.

Effective decision-making across the whole institution will be increased if:

- All governing groups (education, accreditation, and licensure) and all user groups (faculty, staff, students, and veterinary practitioners) participate in decision-making.
- Both teaching and business activities are our priorities.
- The decision-making capability is fully developed at local and central levels (Bates, 2000).

Therefore, a structure that combines centralized and decentralized organization looks like the solution of choice.

Partnership and Collaboration

Partnership and collaboration are the key factors of this proposal. The more institutions participate, the more benefits we will have. Therefore, all veterinary schools, AVMA, AAHA, AAVMC and other veterinary organizations worldwide may be considered as 'beneficial partners.'

This is a short (preliminary) list of institutions that have outstanding results, and we can consider them as desired 'key partners' or role models (benchmark partners):

Veterinary Education Online (University of Illinois) offers nine online courses (continuing education for today's veterinarian): http://vetmed.illinois.edu/veo/.

Oklahoma State University, Center for Veterinary Health Sciences: https://moodle.cvhs.okstate.edu/

LIVE – Lifelong Independent Veterinary Education is a Centre for Excellence in Teaching and Learning (CETL) in the UK. LIVE is specifically focused on capturing and expanding the best teaching and learning practices in veterinary education, both nationally and internationally through inter-professional collaboration**.**
More: http://www.live.ac.uk

Veterinary Food Safety Education Learning Object Repository is looking to expand and incorporate the food safety learning objects into an e-course that can be shared across institutions (McDonlad, 2009).
More: http://webcls.utmb.edu/d2d/

University of Glasgow, School of Veterinary Medicine has more than 25 online/blended courses.
More: http://vet.moodle.gla.ac.uk/

CLIVE Consortium: Computer-aided Learning In Veterinary Education is a consortium of the six United Kingdom veterinary schools (+ 17 associate members from four continents). CLIVE is focused on Computer-Assisted Learning (CAL), an established and expanding feature of veterinary undergraduate education in all subjects of the veterinary curriculum (CLIVE, 2007).
More: http://www.clive.ed.ac.uk/

Edinburgh Global Health Academy. One World One Health -- Working together to support the creation, dissemination and the translation of global health knowledge across a global community of health practitioners, trainers, researchers and policy makers. http://www.globalhealthacademy.ed.ac.uk/

VIN- Veterinary Information Network is an online learning community with more than 42,000 members: www.vin.com

IVIS - International Veterinary Information Service is an online publisher of veterinary books and proceedings. The IVIS Web site includes 1,673 book chapters and articles: http://www.ivis.org .

IVIS online courses. IVIS provide online courses in partnership with four global providers of veterinary professional education:

- **Royal Veterinary College's** Continuing Professional Development (CPD): http://www.rvc.ac.uk/CPD
- **Center for Veterinary Education**, University of Sydney: www.cve.edu.au

- **VetMedTeam** provides free and fee-based online courses for technicians and veterinarians: www.vetmedteam.com
- **Lifelearn** has products and services for veterinary continuing education, client communications, and reference: www.lifelearn.com/

School of Veterinary Medicine, University of Sydney has been an active researcher and innovator in the area of Information and Communication Technology in Learning and Teaching. As a result, a few of its faculty members received MSc and PhD degrees in education technology.
In addition, the school has created:

- Veterinary Information Portal (VIP): http://vip.vetsci.usyd.edu.au/
- Veterinary Education and Information Network (VEIN): http://vein.vetsci.usyd.edu.au/
- OLIVER – Online Library of Images for Veterinary Education and Research: http://oliver.vetsci.usyd.edu.au/
- Center for Veterinary Education: www.cve.edu.au (more than 300 hours of challenging online CE programs)

VetScholar is an innovative online learning program for veterinarians that has received outstanding reviews from participants and won the award for the best open source software use in community organizations at the New Zealand (2007). More about VetScholar is available at: http://vetscholar.vetspace.org.nz/

WikiVet.Net is a Web site and Community of Practice developed by MediaWiki - the same software as Wikipedia, but focused solely on veterinary medicine and with a much more robust quality control system. More: http://wikivet.net/

Proposal – Preliminary Action Plan

To start development of a collaborative educational system, we propose these actions (*act now and commit to fine-tuning and midcourse corrections as we go)*:

1. **Networking stage**
    a. **Inform all potential stakeholders** about this plan and invite them to participate. Potential stakeholders are veterinary schools, AAVMC, NAVMEC, veterinary associations (AVMA, AAHA +) worldwide.
    b. **Gather development team**: We need experts to cover all aspects of this project and at least one highly respected/influential eLearning experienced expert.
    c. Summarize tools and know-how all potential stakeholders have.
2. **Administrative stage:**
    a. **Infrastructures and equipment.** Find a Moodle hosting solution. Moodle can be hosted 'in house' or a commercial Moodle hosting solution can be used.
    b. Install and customize a Moodle community hub.
    c. Create an example of a course that can be shared.
    d. **Training**. Initiate a teacher/trainer training program. Great programs already exist, so we can start with one pre-existing program.
    e. Design Personal Learning/Working environment – to ease collaboration and training.
    f. Prepare fundraising plan (sponsors, fees, advertising).
    g. Create manuals for administrators.
3. **Progressive stage:**
    a. Promote idea through social media: start a Facebook group, describe project at Wikipedia, tweet about it . . .
    b. Contact all potential partners and organizations leaders as an Open Courseware Consortium to gather all knowledge and support we can.
    c. Prepare more detailed strategic plan (mission, vision, structure, hosting, consulting, training and support . . .).
    d. Present the detailed plan publicly in at least a blog and wiki format and invite all relevant experts to participate in the development. Ask for, propose and promote new ideas.
    e. Organize support services.
4. **Transformative stage**:
    a. Propose a list of desired features for each course that will be shared through the Consortium.
    b. Organize an official conference where the plan will be presented and discussed as soon as the framework is defined.
    c. Collect all available online courses and share them.
    d. Benchmark.
5. **Continuous development** with motto: *act now and commit to fine-tuning and midcourse corrections as we go* – as noted in The National Educational Technology Plan 2010 (Office of Educational Technology, U.S. Department of Education, 2010)

Action Research – Map

Action research is a progressive and reflective problem-solving process led by individuals working with others in teams. It combines collaborative problem-solving with data-driven collaborative analysis or research. Action research provides a better understanding of underlying causes enabling better management of personal and organizational changes.

The proposed action research map is:

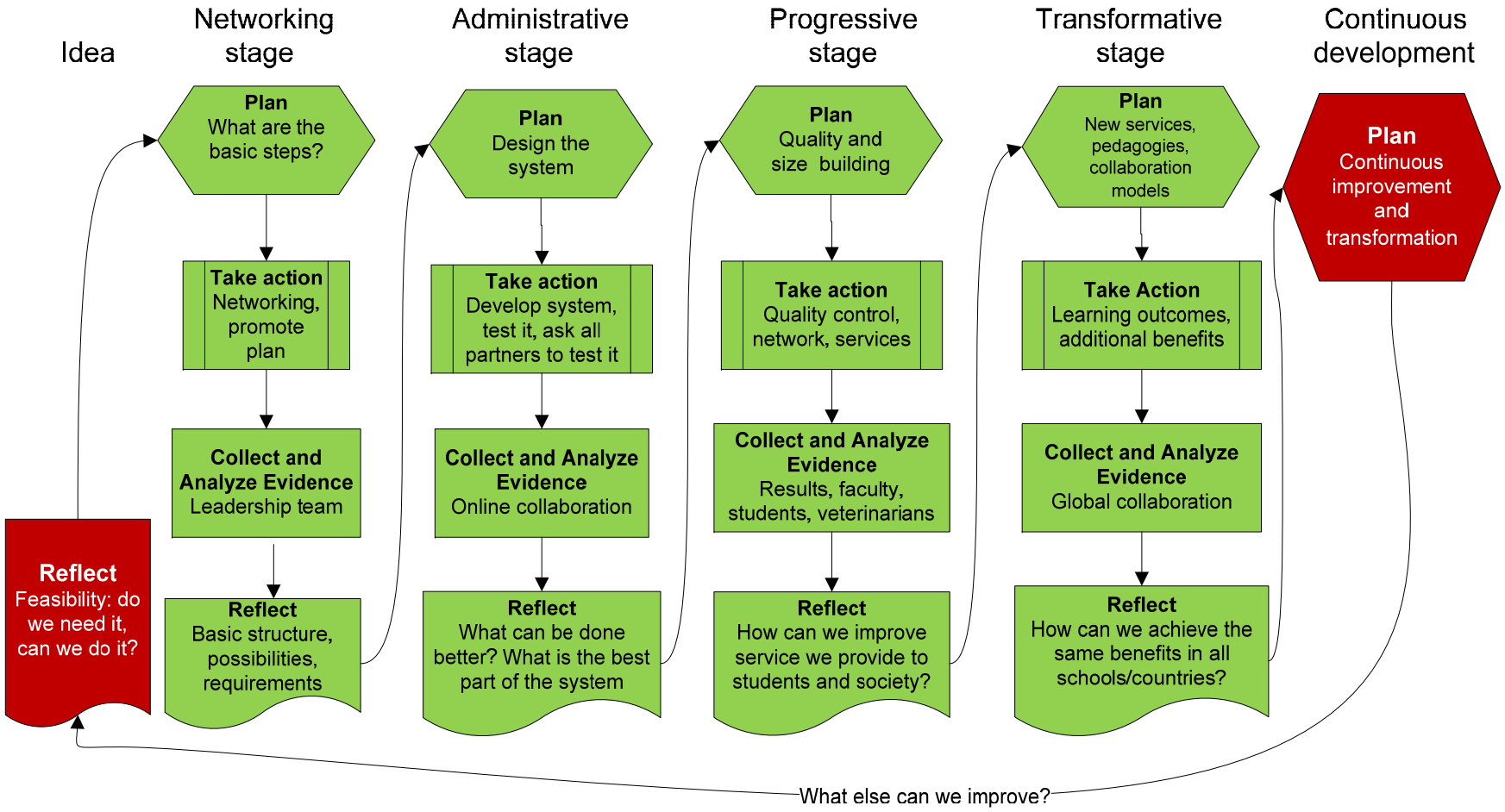


Figure 8. Action plan

Building Momentum around Possibilities and Drivers

Building momentum around shared vision, well-planned actions, collaboration and involvement of stakeholders and leaders at all levels while being innovative, flexible, open and outcome-oriented can significantly increase success of a project. Momentum can attract new partners and keep everyone engaged and energized through the process. Therefore, it is very beneficial to prepare a plan on how to build and keep momentum in an early stage of a project.

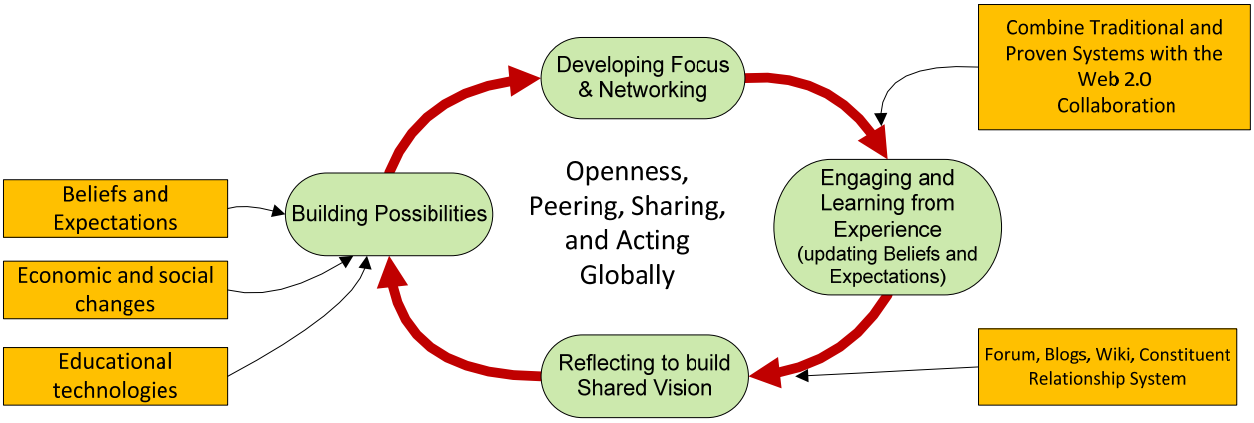


Figure 9. Building Momentum

Drivers for change. Universities and veterinary schools exist within political, cultural and social contexts that shape their policy and practice (Hammond, 2003). That context shapes three main drivers:

- Economic and social development,
- Beliefs and expectations of the role of education in our ever-changing society,
- Development of educational technologies that have the potential to enable us to achieve these objectives.

Change. During the last 10 years, changes on the Web created significantly different context, and all three drivers were visibly influenced/strengthened. Web 2.0 technologies and Wikinomics are recognized as the main change agents. Therefore, let's say a few words about those changes.

Web 2.0 is a framework that facilitates collaboration, user-content creation, information-sharing, user-centered design and inter-operability on the Web. With Web 2.0 tools, users can collaborate, create social networks, create or edit content and, what is very important for us, they can teach, learn and collaborate on course development. Leading Internet giants such as Google, Facebook, YouTube and Wikipedia made outstanding, globally important success as a part of a Web 2.0 framework.

Wikinomics is a framework or movement that brings people together to create a common knowledge through mass collaboration. It represents as important a historical phenomenon as the birth of bureaucracy (Staley, 2009) or the Industrial Revolution. It is based on Web 2.0 technologies such as social-networking sites, blogs, wikis, and video-sharing sites.

Probably the best known example of wikinomics is Wikipedia. It is a free online encyclopedia that was founded in 2001 and allows anyone to edit. It has 3.3 million articles in English (15 million all together), compared with 100,000 articles in Encyclopedia Britannica.

While it has 33 times more articles, the difference in accuracy is not particularly great. Research by Nature (Giles, 2005) showed that, on average, Encyclopedia Britannica has three inaccuracies per article, while Wikipedia has four.

Britannica does Wiki. Explosive development of Wikipedia has forced Encyclopedia Britannica to accept new rules. Recently, Encyclopedia Britannica is offering editing and adding new article options. Editors have to confirm changes before they become public.

Figure 10. Britannica.com 2.0

A win-win situation. Dr. Diane Frank (Frank, 2009), president of the Canadian Veterinary Medical Association (2008/2009) noted that Wikinomics principles in the veterinary community 'would certainly be a win-win situation for those involved.' Fast development of www.WikiVet.Net gives additional strength to her statement.

Four cornerstones of success. The main principles of Wikinomics (Tapscott, Williams , 2008) are Openness, Peering, Sharing, and Acting Globally:

- **Being Open**. Schools that open their doors to external ideas and human capital will outperform schools that rely solely on their internal resources and capabilities.
- **Peering**. Peering leverages self-organization. For some tasks that style is more productive than traditional hierarchical management.
- **Sharing**. In a super-productive collaborative world, schools and companies have to share part of their intellectual capital so they can actively collaborate and generate new intellectual capital plus improve their position in the global economy.
- **Acting Globally**. Winning schools have to act globally. They are globally important institutions and globalized collaboration is the only way to stay at the top.

Traditional and proven tools + Web 2.0 collaboration. Adoption of those principles has become an important prerequisite of globally significant success. In other words, universities can gain great benefit if they invigorate their traditional structures and procedures with benefits of Web 2.0. For example:

- An active community of teachers that actively collaborate through wiki and a forum (Web 2.0, Wikinomics) can significantly ease development of classical courses (face-to-face, blended or online)
- A peer-reviewed wiki can generate results like WikiVet.Net has.

Tools for optimal combination. Moodle 2.0 as a Learning Management System provides a well-structured and well-controlled learning environment, just like traditional universities. However, at the same time, Moodle 2.0 is designed as an integral part of the Web 2.0 framework. It is interoperable with all major Web 2.0 applications, and Moodle Community Hubs provide a powerful collaborative framework while letting each institution having absolute control over their courses and their Moodle installation. All we have to do is turn on or off features we do or do not want.

Beliefs and expectations. While economic and social factors and educational technologies are stressing that: 'Yes, we have huge possibilities and yes we can and we should make a change', beliefs and expectations are still at a critical point. That is why it is important to address skepticism about online education and collaboration, particularly around questions of quality, workload, and loss of control. Research done by MacKeogh and Fox (2009) concluded that the faculty of one traditional university wants to retain control over course delivery (66%) and they favor collaboration with institutions (82%), while less than one-third favor outsourcing. Their attitudes to technology supported education are variable ranging from highly supportive and experienced users to highly skeptical. That is why it will be very helpful if a well-planned and articulated (e)learning strategy is developed and promoted while all stakeholders have a chance to be actively involved in the process. Through such a process, we can mobilize supporters and convert skeptics.

Technical Support and pedagogical skills. Numerous researches stresses that faculty requires much more and much better support for educational technologies than they usually get (Bates, 2000). Furthermore, up-to-date education supported by technology requires not just technological skills but new educational skills.

Tools to build momentum. The Web 2.0 framework provides numerous tools to ease collaborative change management and improve results and satisfaction of all stakeholders. Proper selection and usage of such tools can be very important for the future of a project like this one. Forums, blogs, wikis, Facebook, constituent relationship management systems (eg. CiviCRM) are just a few of the tools we can use.

Mobilizing Global Network. The global network provides significantly more options than a regional network. Niall Sclater, director of Learning Innovation at the Open University concluded (Bierhals, 2009): "It wouldn't make sense to restrict [partnerships] to the UK or Europe. You're not getting all the expertise that's around."

Power of Global Network. If we mobilize all veterinary faculty experienced with Moodle course development, we will see that we have a huge number of experienced e-learning professionals and a significant number of interactive online courses. Just to name a few:

- Veterinary School University of Illinois has nine online courses (http://vetmed.illinois.edu/veo/)
- Centre for Veterinary Education (cve.edu.au) has more than 300 hours of continuing education
- VetScholar (vetscholar.vetspace.org.nz), an award-winning online learning program has more than 30 courses
- Veterinary School in Glasgow has dozens of courses
- A commercial educational provider will probably be interested if they can promote their courses through the network we are trying to build.

Results. That means that if we open our doors (benign open) while we are peering, sharing and acting globally, in no time we may have more than 100 courses, hundreds of experienced partners and enough power to make and keep momentum.

Chief Networking Officer. Of course, it will require time, planning and negotiation to include numerous partners and their courses in our network and there may be a significant number of 'potential partners' that do not fit into this project or cannot participate in this project. But online course providers are just the tip of the iceberg. Globally we have significantly more potential partners and many more potential courses we can include in our network. That is why it may be beneficial to add the Chief Networking Officer (CNO) position to the team.

What is the CNO? The CNO connects people and businesses within the company/school, with other companies/schools, and with consumers (Wikipedia, 2010). The CNO's mission is to facilitate know-how transfer and information flow, fostering innovation, safeguarding diversity, and facilitating profit growth. More about the CNO position is available at: http://en.wikipedia.org/wiki/Chief_networking_officer.

Eight Ways to Build Collaborative Teams. Building collaborative teams is a challenging task in any environment. That is why it is important to have a framework that provides the possibility of 'absolute independence' if a member institution wants. It can be a helpful tool for braking initial resistance and establishing a long-lasting success.

In the long run, development of collaborative teams is an essential task. Lynda Gratton and Tamara J. Erickson wrote "Eight Ways to Build Collaborative Teams" in the Harvard Business Review (Gratton, Erickson, 2007). They noted that:

- *Although teams that are large, virtual, diverse, and composed of highly educated specialists are increasingly crucial with challenging projects, those same four characteristics make it hard for teams to get anything done. To put it another way, the qualities required for success are the same qualities that undermine success. Members of complex teams are less likely—absent other influences—to share knowledge freely, to learn from one another, to shift workloads flexibly to break up unexpected bottlenecks, to help one another complete jobs and meet deadlines, and to share resources—in other words, to collaborate. They are less likely to say that they "sink or swim" together, want one another to succeed, or view their goals as compatible.*

That is why the two proposed these strategies:

- *Investing in Signature Relationship Practices*
  Leaders can encourage collaborative behavior if they make visible investment in facilities that support collaboration.
  An attractive and interactive website may be a good starting point.
- *Modeling Collaborative Behavior*
  At schools/organization, where the leaders demonstrate highly collaborative behavior themselves, teams collaborated well too.
- *Creating a Gift Culture*
  Mentoring, coaching, especially on an informal basis, and networking are a good start. For example, if a mentor and mentee are from different institutions, their mentor-mentee relationship may be a good platform for much wider collaboration between their institutions.

- *Ensuring the Requisite Skills*
  Courses and an online learning community focused on collaborative skills can build those requisites.
- *Supporting a Strong Sense of Community*
  When people feel a sense of community and common goal, they are more comfortable collaborating together.
- *Assigning Team Leaders That are Both Task and Relationship Oriented*
  For outstanding results we need both a good team and focused tasks.
- *Building on Heritage Relationships*
  Start team development with a few people (20-40%) who know one another. If all team members are strangers, it is very probable that they will not be comfortable collaborating.
- *Understanding Role Clarity and Task Ambiguity*
  Cooperation and performance will benefit if the roles and desired outcome are clearly defined, while the team has latitude on how to achieve the task

Full article is available at:

- http://www.internetgroup.ca/clientnet_new/docs/8 Ways to Build ollaborative Teams 2007.pdf

Case Studies

The Open University UK: Creating a Win-Win Situation by Sharing Code and Content

The Open University (OU) UK, one of world's largest distance-learning universities (200,000-plus students) started implementing Moodle Virtual Learning Environment during 2005. Moodle was chosen as a very powerful, modular software with a huge user base. Simultaneously with migration to Moodle, OU decided to change its policy and to release a significant part of learning materials as open educational resources (OER) through the OpenLearn project.

With that, OU had two projects:

- Development of Moodle-based OU internal Virtual Learning Environment and
- Development of OpenLearn initiative (VLE plus courses).

The OpenLearn project has been funded by £ 2 million ($3.2 million) donated by the William and Flora Hewlett Foundation.

Budget was £ 5 million for the development of the two VLEs. The budget covered research, the development of the platform(s), change management, course customizations and all other tasks essential to making the system work.

Moodle Improvements. The OU was developing those projects five years ago when Moodle did not have many features that are standard today, so significant time and money was invested in improvements.

Change Management. By 2005 the OU had numerous not-connected online services. Those services were outdated, hard to maintain, difficult to use and did not support highly interactive education. Despite obvious benefits or new, well-chosen technology, introduction of new technology (change management) was the biggest challenge. A long list of innovations had to be implemented, improved and tested, and a huge number of students and staff had to be familiarized with the new system.

Requirements and skeptics. The university had very high requirements with regard to the new system especially because improvements and a well-functioning system are important tools to eliminate resistance against the new VLE and facilitate change. Of course, skepticism about Moodle and online educations was an additional challenge. Older faculty members, accustomed to using paper during their academic careers, were concerned.

Balance and Change Agent. The OpenLearn project was a very helpful 'balance and change agent.' Because it did not commit any faculty member to provide online classes through OpenLearn, 'there was less resistance.' The university took this forward to collaborate and liaise with faculty. Their intention was to actively involve each faculty member in the process. To make sure that everything is understood, and that everything works as it should, a series of about 45 events was held and each faculty member was asked to attend. In addition, the university created a wiki where faculty could discuss the new VLE.

Cooperation. For the OU the most important source of information and cooperation was the Moodle community (moodle.org). Liaison with other universities can be beneficial. But each university has specific requirements, so the results of such cooperation cannot be compared with results achieved through collaboration with a Moodle community. As Niall Sclater, director of Learning Innovation at the

Open University, illustrates: “What we've found is that with Moodle, we're part of the worldwide community, and that's really the best forum for collaboration and development.” With 36 million of users, 1.2 million of teachers and 3.6 million of courses, bugs and glitches are found and fixed very quickly, and you can expect almost an instant answer for any relevant proposal or question you have.

Support. Although there were proposals to have a dedicated commercial support partner in the process, the team in charge of the VLE has realized that the best source of expertise is freely reachable through the Moodle community. There is no reason to have ‘a middle man’ between the OU and Moodle community.

Result. Today the OU has a working Virtual Learning Environment that is scalable, robust and feature-rich and that is being used more and more.

Benefits of OpenLearn platform. The OU found that the OpenLearn initiative can result in real financial benefits (in addition to $3.2 million in donations) . As of October 2009, 11,000 students had registered through the OpenLearn site.

Potential barriers. Sclater mentions a few barriers that may arise at the beginning of such development.

- **Lack of awareness**. Faculty may not know why/how to use new technology.
- **Lack of incentives**. Faculty may be reluctant to make a change. Pressure from students can help mobilize such teachers.
- **Concern to avoid alienating students**. There is the concern that e-learning methods might exclude some students from participating in courses. Some of them may not have appropriate technology (computer, Internet) or appropriate skills. The OU decided that its focus should be on leading in new technologies and that students would find a way to get a computer with an Internet connection.
- **Risk aversion**. There is reasonable concern that using a system that is still developing might be a risk. However, the OU made sure that the software is stable and that only tested improvements would be added. OU was aware that there may be a problem here and there with the system, but it knew that problems can happen to any system and a solution would be harder to find with a less modular or less flexible platform.

Conclusion. Moodle and free learning materials as part of the OpenLearn project are an indication of how paradigms are changing. Moodle is the VLS of choice because of ‘stability, flexibility, scalability and support.’ The source of feedback and information, 36 million users, could not be duplicated by one company. Change management is significant, if not the biggest cost factor. OU made gradual, step-by-step changes with clear instructions on ‘how to make that step’.

Detailed Case Study is available at:
http://www.osor.eu/studies/the-open-university-uk-creating-a-win-win-situation-by-sharing-code-and-content

WikiVet.Net

WikiVet.Net is a Web site and Community of Practice developed by MediaWiki--the same software as Wikipedia but focused solely on veterinary medicine and with a more robust quality control system (medev.ac.uk, 2008).

For example:

- The content is peer-reviewed by veterinary graduates, residents and subject specialists from vet schools.
- Access to the majority of articles is restricted to the veterinary community. Only chosen peer-reviewed articles are publicly visible. Non-reviewed articles are visible only to users with accounts and they are marked as: 'This article has not yet been peer-reviewed.'
- Only veterinary students, faculty and recognized veterinary graduates may create an account and work on content.
- It is equipped with numerous interactive WikiQuizzes, Flash Cards, Content Map, interactive Case Studies and interactive radiographs.

WikiVet.net has very fast and dynamic development as the picture below illustrates.

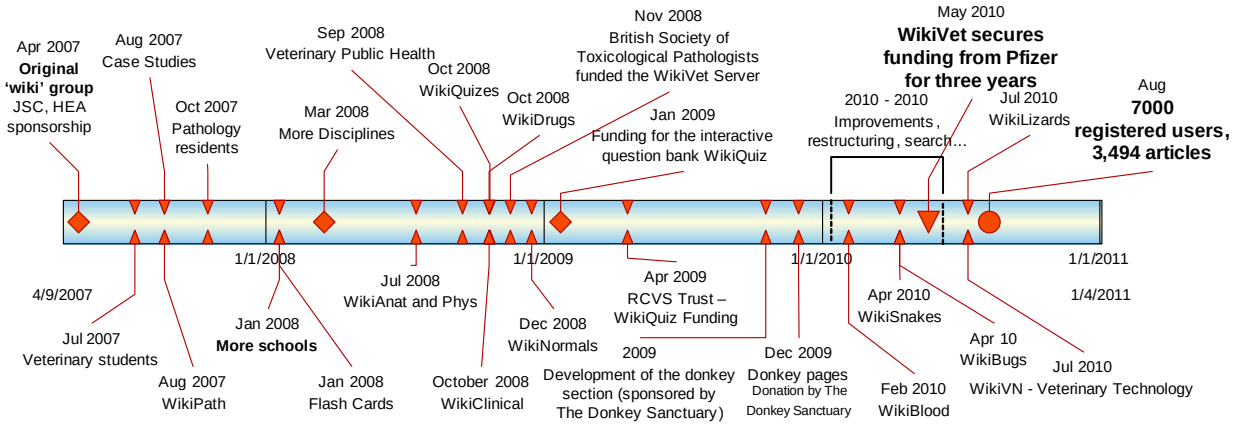


Figure 11. WikiVet.net development

WikiVet.Net started as a joint initiative among four UK veterinary schools (Cambridge, Edinburgh, the Royal Veterinary College and the Nottingham Veterinary School) with funding from the HEA[9] and JISC[10].

The plan was to develop a wiki community to support undergraduate veterinary education with these features (Brown, Quentin-Baxter, Belshaw, 2010):

- Comprehensive, activity-rich and quality-assured
- Easy to edit/repurpose and expandable
- Student-led, pedagogically sound and self-sustaining (affordable)
- Potential for international participation: multilingual.
- Able to prepare students for lifelong learning within diverse veterinary fields and promote 'global animal health'

[9] The Higher Education Academy

[10] Joint Information Systems Committee

Platform. Mediawiki was chosen as a platform because it could meet those requirements and most students and faculty are familiar with the look and features of Wikipedia.

Goal. The collaborators were interested in more affordable methods of sharing and organizing resources that would enable them to increase knowledge production while benefiting students and improving pedagogy and overall quality of their educational programs. Wiki is used primarily as a learning tool (not as a textbook).

Context. Because an enormous amount of information is available (vin.com, ivis.org . . .), students do not have enough time and skills to fully benefit from that data. Therefore, easy-to-use peer-reviewed content, WikiVet educational activates and a community of practice help lead to desired learning outcomes. At the same time, students are converted into experienced experts able to utilize available data. Furthermore, there is a huge amount of potentially useful data (stored on CDs, hard drives . . .) that is not easily accessible. Through WikiVet, a significant part of that data can be reused.

Costs. An initial investment of $36,500 (23,000 GBP) was enough to create more than 2,000 interactive wiki pages. In addition, collaborative wiki development is shown to be an extremely valuable learning experience. That is an excellent value for the money (Brown, Quentin-Baxter, Belshaw, 2010). During the first half of 2010, the Pfizer Global Alliances provided 3 years funding for WikiVet (WikiVet.Net, 2010). With that support, WikiVet will employ a project coordinator and significantly increase production. In August 2010 WikiVet had 3,494 articles.

Team. WikiVet has about 45 contributors, 7,000 registered users and about 250 new registrations per week (WikiVet.Net statistic, 2010). Most contributors were very collaborative and productive. However, it took some time to learn how to work together (student-student, student-reviewer), and how to combine information from various sources. Wiki as a tool for collaborative work with numerous updates is very helpful in those situations.

Management and Authorship. The editorial board was composed of community of practice members. The board has the duty to regulate content and resolve eventual disputes. Participants learned about the wiki structure, templates and practices through face-to-face workshops. The face-to-face meetings let team members meet each other, which is beneficial for future online collaboration. Students with leadership abilities have become 'wikimasters.' Their task was to motivate and manage work of other students.

Structure & Process. Content is organized in eight major sections:

- Pathology (WikiPath)
- Anatomy and physiology (WikiAnt)
- Blood and immunology (WikiBlood)
- Bacteriology, virology and parasitology (WikiBugs)
- Veterinary public health (WikiVPH)
- Normal hematology, biochemistry and physiological parameters (WikiNormals)
- Pharmacology and therapeutics (WikiDrugs)
- Clinical information (WikiClinical).

Initial peer-review is made by students, after which staff specialists do final review. Content not reviewed is visible to logged-in members, but a stage of development is clearly noted at the top of each page.

Copyright and Intellectual Property Right. Community of practice has created agreements for collaboration and exploration. According to those agreements, all materials are owned by the contributing institution and licensed under a Creative Commons license.

Future. WikiVet is a work in progress. WikiVet protocols, network and outcomes are still developing. They are developing quickly, results are impressive and the network includes not just numerous veterinary schools, but Pfizer.

Proof that WikiVet is on its way to global success is its partnership with Pfizer, one of world's leading pharmaceutical companies skilled in using enterprise 2.0 tools (cipd.co.uk, 2009) such as Pfizerpedia (internal wiki), discussion forums, blogs, RSS feeds, OneNote[11], SharePoint [12], and tags.

Figure 12. WikiVet.Net Homepage

[11] Microsoft Office OneNote is a software package for free-form information gathering and multi-user collaboration.

[12] Microsoft SharePoint is a software platform developed by Microsoft for collaboration and Web publishing combined under a single server.

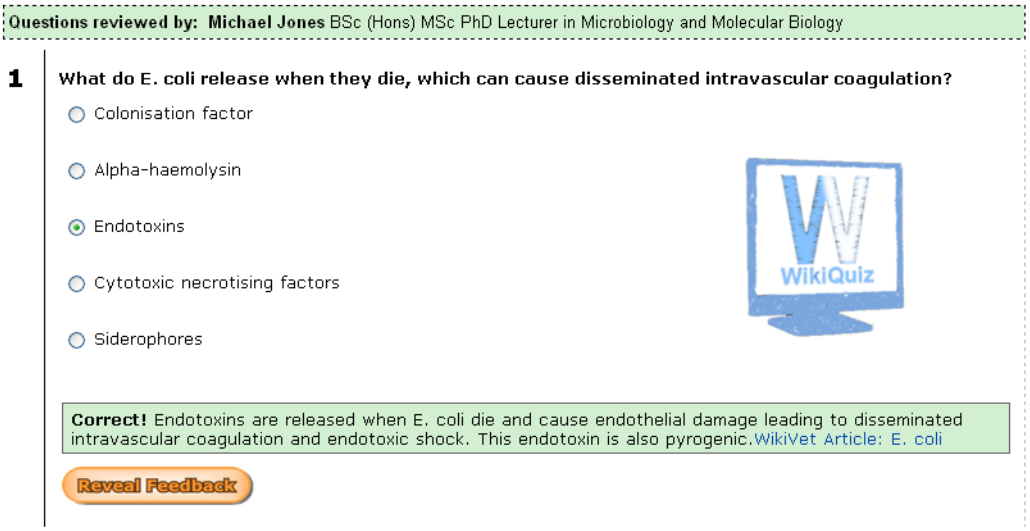


Figure 13. WikiQuiz - example of a question + feedback

Question	Answer		Article
Describe embryological origin of the Thyroid Gland.	The thyroid gland is a downgrowth from the pharyngeal endoderm of the developing tongue.	Reveal	Link to Article
Describe the location of the thyroid gland, it's closely associated structures and anatomical landmarks.		Reveal	Link to Article
Describe the blood supply and venous drainage of the Thyroid Gland.		Reveal	Link to Article
The Thyroid gland consists of various sized follicles. What is the name of the cells which line the lumen of the follicles, and what is their function?		Reveal	Link to Article
Label the following histological section: [[Image:ThyroidGlandFlashCard1.jpg		Reveal	Link to Article
Which Letter represents the location of the C-Cells of the Thyroid Gland, and what is their function in 'Image 1' below?		Reveal	Link to Article

Figure 14. Flash Cards

VetEd.Net – What is Possible Now?

Teachers' perspective is described in the Veterinary Education Consortium example, so in this case study, we will be focused on benefits students can gain from this framework.

Figure 15. Jessica

Student Jessica. Our role model will be student Jessica M. Jessica's log-in data to access her school Moodle site are:

- URL: http://illinois.veted.net/
- Username: Jessica
- Password: cintact us to receive tha password (Tel: 773.470.5592)

This account is active, so you can check everything described in this case study if you use Jessica's log-in data.

Environment. Eight Moodle sites, one Community Hub and one Mahara site are created as sub-domains of the veted.net domain name. In each Moodle site example courses are created. To highlight the potential we have, a majority of created example courses have the same title and description as real online courses created[13] by: Veterinary School University of Illinois, Glasgow Veterinary Faculty, Centre for Veterinary Education (cve.edu.au), VetScholar (NZVA).

Sites. Created sites are:

1. Community Hub
   a. http://hub.veted.net/
2. Mahara ePortfolio site:
   a. http://myeportfolio.veted.net/
3. Moodle sites:
   a. http://illinois.veted.net/
   b. http://my.veted.net/
   c. http://glasgow.veted.net/
   d. http://pre-vet.veted.net/
   e. http://vetscholar.veted.net/
   f. http://cve.veted.net/
   g. http://avma.veted.net/
   h. http://aaha.veted.net/

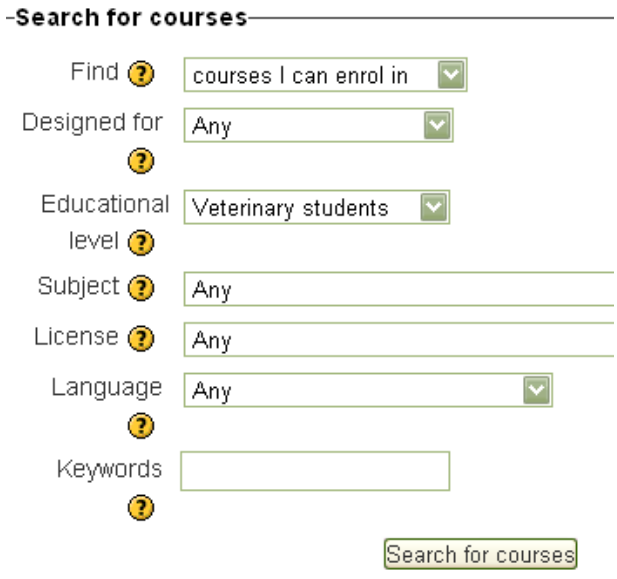


Figure 16. Community Hub Search Options

[13] Content is here for the purpose of this presentation/case study. It will be removed as soon as this case study is done.

When Jessica logs into http://illinois.veted.net/ at her school site, she has access to two courses she is attending (Parasitology and Pain Management) and two collaborative groups (International Veterinary Students' Association Collaborative Space and Veterinary Careers). However, that is just the tip of the iceberg.

Veterinary Community Hub. Jessica often goes to http://hub.veted.net/ to check if there are any interesting courses or collaborative groups. Because Jessica will do a two-month internship at the veterinary school in Glasgow, she recently joined the IVSA UK collaborative space she found through the Community Hub. Colleagues from IVSA UK, have already arranged accommodations for Jessica.

Roaming. Users can roam between illinois.veted.net and other sites in the network. All Jessica has to do to enter any of network servers is to log into illinois.veted.net and then click a link in the Network servers menu (see the picture in the right column).

While she is at glasgow.veted.net, it is noted in the top right corner:

- You are logged in as Jessica M. from Illinois VetEd Network (Logout)

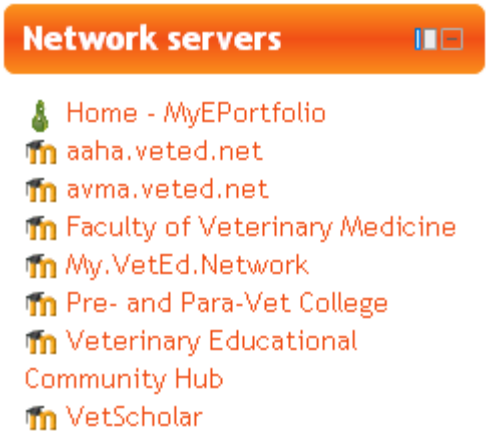


Figure 17. The Network servers menu

Guest Access. Each course and each collaborative group at glasgow.veted.net has different access rules. Some of them are available just for their local students, some for collaborative groups (such as the IVSA UK group), are open to all logged-in users, and some courses have available guest access. Guest access means that logged-in users can enter a course (or part of course) without being required to enroll and without being able to post anything.

Networking and promoting. A few departments at glasgow.veted.net made their courses available to guests. They concluded that it is an affordable and safe way to promote their departments and their school, attract ambitious partners and students while helping a broader population of students.

Support for open educational resources. Last year glasgow.veted.net received a grant for development of open educational resources. All courses with open guest access received part of that funding.

Guest Jessica. Jessica's first interaction with glasgow.veted.net was while she was searching for data about tropical parasites. Through the community hub, she found a parasitological course with guest access at glasgow.veted.net.

ePortfolio. Jessica started using a guest access to the course and she liked their research and the way the information is taught. She contacted the head professor, Dr. Elizabeth.
Receiving a phone call or e-mail from a student from a foreign country was not as easy for Dr. Elizabeth to handle during the pre-networked era. Now, it's different.
As soon as she received Jessica's e-mail, Dr. Elizabeth made two clicks and in less than 7 seconds Jessica's ePortofolio was on her screen. Wow, the ePortfolio shows that student Jessica is skilled and ambitious.

Her undergraduate work, sports activities, work in the International Veterinary Students' Association, extracurricular courses, and undergraduate research she made about parasite's biology are quite impressive. Dr. Elizabeth concluded that an internship at glasgow.veted.net would be a nice addition to Jessica's ePortfolio.

Paid-for courses, evaluation and negotiation. Jessica participated in an online paid course about companion animals' parasites in Australia and one course about tropical parasites in the South African Republic. Because Australia and South Africa are new members of the network, those courses are not accredited by Illinois.VetEd.Net or Glasgow.VetEd.Net. The credit transfer agreement is still 'in process'.

Power of ePortfolio. All Jessica's results, the best forum posts she made and her pictures of parasites are available in her portfolio. Jessica made just a few clicks to export that data to her portfolio, and now she can easily present that data to whomever she wishes. Before Jessica contacted Dr. Elizabeth, she made her portfolio visible to Dr. Elizabeth. Dr. Elizabeth appreciated that. She concluded: 'A few posts from the Parasitology online course Jessica had in South African describes Jessica's knowledge, skills and attitudes – probably better than officially recognized grades. Sure, it would be better if we can have both . . . but that ePortfolio is an amazing thing. '

Power of collaboration. Animal welfare is Jessica's passion. Last year she attended an online course in animal welfare offered at MSU. She thought that was a great course, but 'animal welfare deserves much more than one course.' That is why she was happy when she heard that MSU, Ilinois.veted.net, my.veted.net, Glasgow.veted.net (four veterinary schools) and avma.veted.net and aaha.veted.net (two nonprofit veterinary organizations) are planning to organize a group of animal welfare courses. Their goal is to provide high-quality, science-based courses developed by international welfare experts and available to veterinary students and practicing veterinarians regardless of geographic location. "Wow," she said. It is not just that we will have a group of world-known experts designing multiple animal welfare courses together, but they are also planning to build an 'animal welfare learning community'. That means that faculty, veterinarians and veterinary students will be able to discuss, learn and teach about different aspects of animal welfare. And all that knowledge will be converted into newer, better, more dynamic courses in animal welfare.

About the Author

Vjekoslav Hlede holds a DVM, and is an Instructional Designer and Moodler.
E-learning strategies. He is the author of the project "Development of the Intranet, E-learning facilities and Online Management at the College of Veterinary Medicine, University of Zagreb" (2004), the first such e-strategy in Croatia and one of the first in the world. He is co-author (2007) of E-learning strategy for the University of Zagreb, which has more than 60,000 students.

Course Development & Award. Online courses Vjekoslav has created (3) are among the most popular in the Croatian academic community. The last one, E-course for e-mentors (Vjekoslav was the head developer) won the Comenius EduMedia Seal 2009, an international award.

Teaching. Vjekoslav has taught graduate courses encompassing "Introduction to E-learning," "Teaching and Learning," "Selecting and Using Technology," "Planning Courses," "Instructional Strategies," "Methodologies and Techniques," "Assessing Learning" and "Academic Support. He has taught 'E-course for e-mentors,' a monthlong course focused on Moodle teaching techniques.

Moodle sites. www.seeep.org/moodle/, my.chicagovma.org, veterinarymentor.org and my.cabriniconnections.net are the most recent Moodle sites Vjeko has created.

History. Vjekoslav started his e-learning career as a veterinary student. He created numerous learning materials (more than 1,000 pages). Later, as the International Veterinary Students' Association Information Technology Officer (2002-2003,, 2003/2004), Vjekoslav redesigned the IVSA.org Web site and initiated and led the Modern Technology of Education IVSA Standing Committee.

Location. Vjekoslav has been working with the Veterinary School at the University of Zagreb for 2.5 years. His wife, Dr. Tracey Hlede, is a Chicago native, so the couple lives in Chicago now.

Education. Vjekoslav graduated from the University of Zagreb with his DVM degree, has an associate degree in Web Development (ProAnima College), graduate certificates in E-learning Management and E-learning Tutoring (Croatian Academic and Research Network, two semester courses), and e-JUMP 2.0 (Implementing e-Learning 2.0 in everyday learning processes in higher and vocational education).

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