1. INTRODUCTION

From a historical viewpoint, the Middle Ages represented a period of great contrast in relation to Classical Antiquity. The great philosophers and thinkers were forgotten and almost all documents were destroyed during the barbarian invasions. Only a small part of the Greek and Roman heritage preserved by the Church and by the Arab culture remained intact.

The Church, however, kept this material under lock, and it was only after the Crusades that Western Civilization regained access to this material. The Crusades opened the West’s door to a large amount of information that had been inaccessible until then. This led to great cultural excitement in the beginning of the millennium, and moment was marked by the sprouting of the first universities: Bologna, Oxford, Salamanca and Paris.

Universities emerged out of the need to share knowledge. They were centres for the dissemination of knowledge. The first universities were initially much more theoretical than practical, and focused on preparing a new generation of predominantly Christian European thinkers.

Universities maintained this much more informative than formative character for many centuries. One of the few exceptions was the University of Berlin (1810), created by Wilhelm von Humboldt, a humanist devoted to uniting science and philosophy.

Close to the 20th century, however, a new line of pedagogical thought which broke free from traditional informative models began to emerge. One of the pioneers in this new line of thought was the American John Dewey (1859-1952), who played an important role in disseminating the principles of the “New School”. Dewey severely criticized the traditional models, particularly the emphasis they gave to intellectualism and memorization. For Dewey, the teaching-learning process should be based on the understanding of that education is constituted by a dynamic combination of knowledge and experience that had little to do with previous static ideas. Students and professors have their own experiences that can and should be used during the educational process. The interaction of the two rather than the mere delivery of formal contents should become the focus of
knowledge-building. Dewey considered learning and the production of knowledge to be an essentially collective process.

Another important supporter of this approach was the famous Swiss educator Jean Piaget (1896-1980). Piaget attended the University of Neuchâtel, where he studied Biology and Philosophy. He earned a PhD in Biology in 1918, when he was 22 years-old. For Piaget, knowledge is constructed as a result of the interaction between the environment and the individual. The complexity of this interaction leads to intelligence. In other words, the more complex the interaction, the more “intelligent” the student. Piaget’s thought is one of the bases of the pedagogical model that would come to be known as “Constructivism”.

After Piaget, the need to transform the university from an informative centre to a formative one started to gain force. UNESCO, the United Nations body in charge of education, approached this question in a document that was to become a central reference to practically every educational institution. In this document, education is seen as a crucial component of peace, in a process where citizens become aware of each other and develop a sense of responsibility with respect to other people’s rights and freedom. This position was consolidated in the famous report "Education: a treasure to discover", published in 1996, as result of the International Commission of Education for Century 21, presided by Jacques Delors. In this report, education is considered to be a life-long process based on four pillars: “learning to know”, “learning to make”, “learning to live together” and “learning to be”.

However, despite this pedagogical background, most education institutions have continued to follow the original model of the medieval university: classroom-based learning where professors deliver their knowledge to the students, who in turn take notes and memorize what was said in order to get good grades in tests and exams. Technology has changed this style of teaching slightly, allowing professors to prepare more sophisticated presentations, especially with the use of software such as Microsoft PowerPoint. However, this is only a nicer wrapping for the same old concept: professors talk and students take notes.

Technology cannot fully help to improve the learning process without a profound revision of the traditional model of education, especially in the higher education sector. The purpose of the present article is to introduce some technological resources that can be used in the teaching of Buiatrics according to the new pedagogical concept of interactivity and constructivism.

2. COMPUTER-ASSISTED BUIATRICS TEACHING

Problem-based learning (PBL), a pedagogical approach that challenges students to “learn to learn” working cooperatively in groups to seek solutions to real world problems is one of the concepts that can be introduced in the entire Veterinary Medicine curriculum. It can also be adopted in single courses. We have been using this approach in some classes of Buiatrics with the help of some technological tools.

We used the software Macromedia Breeze Presenter to produce an online case report. Breeze allows a regular Microsoft PowerPoint user to publish contents in a Flash Platform, one of the most effective experiences for rich content applications and communications across browsers, operating systems, and devices. Breeze enables the user to author narrated presentations and provides support for high-impact content through adaptive streaming of audio and video (Image 1).
For example, using this resource, we reported a case (in this example, ovine verminosis) and published this case inside a Learning Management System called Blackboard Learning System. This is a software application for institutions that provides a platform upon which instructors can teach and facilitates student participation, communication and collaboration using tools that enable synchronous and asynchronous interaction (Image 2).

Image 1. Layout of PowerPoint using Breeze Plug-In to record audio

Image 2. Breeze presentation inside the Blackboard system
The case was presented online and, after that, students had some days to discuss about the case in a web forum (Image 3) and to propose diagnosis and treatment.

Image 3. **Web forum used by students to discuss case and propose diagnosis and treatment**

This kind of interaction is called “asynchronous” because students and teachers don’t need to be online at the same time. They can watch the case report and post messages whenever they want, in their own time.

Another form of communication is “synchronous” interaction. We have recently used synchronous interaction together with the University of Montreal. This was carried out via a web-based conference system (CentraOne, Centra Software Inc., Lexington) in three different teaching scenarios: distance learning lecture with large groups of students in present in the classroom, distance learning lecture with students outside the classroom, and virtual clinical rounds. People from Canada, France, Brazil, Mexico, Uruguay, Morocco, Belgium and the USA participated in the sessions. An analysis of the sessions indicated there is a need for a certified and secure client-server system, but many of the systems available were not according to the standards required. Another outcome of the experiment was the realization that certain pedagogical weaknesses only became apparent thanks to the information and communication technologies employed during the conferences. These results allow us to conclude that, in spite of difficulties related to the stability and security of the Internet connection, the synchronous use of information and communication technologies is a viable technical and pedagogical solution, with good prospects of improving the educational process in veterinary medicine.

Another system that allows synchronous web conference is the Macromedia Breeze Live, with almost the same resources of CentraOne.
The central point in all these new improvements in educational models is that students can work together, in a collaborative way, in a “Networked Learning Environment”. An example that shows this is really possible is Wikipedia (http://www.wikipedia.org), an online free encyclopedia started in 2001 and currently with around 3 million articles. Visitors can freely edit articles and, in December 2005, Wikipedia had 4.7 million edits, averaging around 150 thousand edits per day (1.8 edit per second).

Image 5. Wikipedia, a collaborative online encyclopedia
Some important phenomena are happening in the web, allowing students to get together in online communities. Google’s Orkut service is an impressive example of that. All over the world, Orkut (http://www.orkut.com) connects people who share personal interests, want to make friends or gather information. Each user has a home-page with a complete profile including personal information like photos, hobbies, friends and so on. Users send messages to each other and participate in common-interest groups to share information. Orkut has almost 14 million users over the world, 53% of whom are 18-25 years old, the age of our students.

3. CONCLUSION

In the recent past, technology in education was associated with CD-ROMs, web searches (Medline, Consultant, etc…) and even online books. However, all these resources are related to an obsolete way of teaching. It is felt that the future of computer-assisted teaching lies in a new concept of education that is based on networked online communities, where students can be active, participative and collaborative.

4. SUMMARY

The majority of educational institutions continue to follow the original model of the medieval university to these days: classroom-based learning where professors convey knowledge to the students, who take notes and memorize what is said in order to get good grades in tests and exams. Technology has changed a little bit that style, allowing professors to prepare more sophisticated presentations, especially with the use of software such as Microsoft PowerPoint. However, this is only a sophisticated cover for the same old concept: professors talk and students take notes. Technology cannot fully help to improve the learning process without a profound revision of the traditional model of education, especially in the higher education sector. The purpose of the present article is to introduce some technological resources that can be used in the teaching of Buiatrics according to the new pedagogical concept of interactivity and constructivism. Concepts such as PBL (Problem Based Learning) in an online environment are discussed. Synchronous and asynchronous online learning resources are presented, with examples of new, networked learning...
environment such as the Wikipedia and Google Orkut. It is concluded that the future of the computer assisted teaching is mainly based on a new concept of education, where students will be more active, and participate and collaborate in many networked online communities.

5. KEY WORDS

Computer assisted teaching, interactivity.

6. RÉSUMÉ

La majorité des organismes de formation continuent, encore de nos jours, à suivre le modèle original de l’université médiévale : les enseignements magistraux où les professeurs apportent les connaissances aux étudiants, qui prennent des notes et mémorisent ce qui est dit afin d’obtenir de bonnes notes aux tests et aux examens. Les possibilités technologiques ont quelque peu changé ce style d’enseignement, en permettant aux enseignants de préparer des présentations plus sophistiquées, en particulier grâce à l’utilisation de logiciels tels que Microsoft PowerPoint. Cependant, ce n’est qu’une couverture sophistiquée pour le même concept ancien : l’enseignant parle et les étudiants prennent des notes. La technologie ne peut pas aider à l’amélioration de l’apprentissage sans une révision profonde du modèle traditionnel d’éducation, en particulier dans l’enseignement supérieur. Le but de cet article est de présenter quelques unes des ressources technologiques qui peuvent être utilisées pour l’enseignement de la Buiatrie en accord avec le nouveau concept pédagogique d’interactivité et de constructivisme. Les concepts tels que le PBL (apprentissage à partir d’exemples) dans le cadre d’une connection en réseau sont discutés. Les ressources d’enseignement en ligne, directes ou différées, sont présentées, avec des exemples du nouvel environnement d’enseignement en ligne tel que le Wikipedia ou Google Orkut. En conclusion, l’avenir de l’enseignement assisté par ordinateur est principalement basé sur un nouveau concept d’enseignement, où les étudiants seront plus actifs, et participeront et collaboreront à de multiples communautés en réseau.

7. MOTS CLÉS

Enseignement assisté par ordinateur, interactivité.

8. REFERENCES

