



PERSPECTIVES

Web-based learning and technology — Chinese Orthopaedic Association and World Orthopaedic Association Beijing Summit task group[☆]



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Summary Orthopaedic translation is a dynamic process. It entails an ever changing working relationship among the various key professional groups, namely, orthopaedic surgeons, scientists and engineers, industries, and regulatory bodies. Interactive sharing of information among these groups is the key to the fast development of orthopaedic translation in the past decades. There is an enormous pool of information on the Internet, which may pose a puzzle to the readers. It is therefore imperative for the *Journal of Orthopaedic Translation* to examine the power of web-based learning technology at the onset of the journal's launch.

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[☆] This perspective article is a summary of a panel discussion by the task force formed at the annual meeting of the Chinese Orthopaedic Association in 2012.

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Introduction

New and cutting edge information is now made accessible with online publication and is available quickly on the public domain unless restricted by consideration for patent registration. Therefore, an enormous pool of information is available on the Internet, often with much diversifying views, which may pose a puzzle to the readers.

The importance of translational research is being recognised rapidly by all spectra of the scientific community. The *Journal of Orthopaedic Translation* is purely dedicated to the art of translational research, and will be a monumental step in the advancement of musculoskeletal care by bringing cutting edge knowledge to the forefront and allowing the pioneers of orthopaedic translation to exchange and mutually enhance expertise. The proper development of web-based learning and technology may lead to incredibly promising advancements in orthopaedic translational research; it is therefore imperative for the *Journal of Orthopaedic Translation* to examine the power of web-based learning technology at the onset of the journal's launch and to consider its merits and limitations.

Background

Traditionally, doctors have learnt from lectures, textbooks, syllabus materials, and journals. Rapid technological advances increasing the usage of the Internet has caused the traditional learning environment to incorporate virtual/web-based learning characteristics. During the Beijing Summit of the 2012 Chinese Orthopaedic Association Congress and World Orthopaedic Alliance, a speciality task group was assigned to discuss this rapidly developing technology that may be a significant milestone in the spectrum of medical education. Expert views were solicited from key opinion leaders in order to form a coherent and critical view of the advantages and limitations of this new technology.

Current scene

Web-based learning utilises the vast usability of the Internet to create a "learning community". Web-based education has shown promising potential in improving medical students' learning by demonstrating high levels of functionality and effectiveness. Medical students have also shown a significant level of acceptance for this type of education [1]. Modern physicians learn differently, and therefore new approaches to learning need to be developed. Younger surgeons want "bite-sized" and concise information that is easy to access and find. They want immediate answers to current clinical questions and do not wish to spend long hours researching. New-generation surgeons also prefer more individualised learning formats that will allow them to learn at their own pace, help them achieve their learning objectives, and are tailored to their learning styles [1].

Web-only contents including podcasts, on-line meetings, and on-line libraries, are more commonly used by younger orthopaedic surgeons than those who are more accustomed to "traditional" methods of teaching such as textbooks and lectures. An incredibly popular example of web-only

content is wikis, consisting of expandable collections of interlinked web pages in which any user can add, remove, and edit information. Wikis for doctors and researchers include Wiki Surgery [2], Healtheva [3], Ganfyd [4], and Sermo [5]. Some of these sites allow only doctors who can prove their medical credentials to edit information in order to guarantee quality assurance and accuracy of data [6].

Podcasting is another popular web-based technological advancement that is rapidly being adopted in medical school curricula for student lectures. Students are able to access chapters from textbooks and download libraries of respiratory sounds online, a concept that was not heard of in the past. Notable examples of podcasts are *New England Journal of Medicine* podcasts, *Johns Hopkins Medicine* podcasts, and the ABC Radio's podcasts [6].

Social networking is also becoming increasingly popular and can be a novel method for sharing information regarding difficult or unusual cases. New technology also allows active integration of educational initiatives from orthopaedic centres around the world. Doctors care about two major issues: whether the knowledge is cutting edge and whether it is reliable. These two issues need to be considered carefully to ensure a proper balance between them.

Advantages and limitations

Web-based learning allows for a large amount of information to be searchable easily and available to users around the world, making it a user-oriented knowledge acquisition process. This type of learning overcomes physical barriers and also offers flexibility of scheduling for participants [7]. It provides a platform for a diverse group of users, both locally and globally, to share and exchange knowledge and findings conveniently, which makes it a rich and diverse learning environment [8].

Although the web-based learning environment increases the availability of vast and diverse information, it also results in information overflow. The amount of information can be overwhelming if not organised and delivered properly. A study conducted by the American Academy of Orthopedic Surgeons found that learners of a virtual learning environment want answers for their key questions in the most efficient manner possible without wasting time on unrelated information. Therefore, a balance needs to be established between providing a vast amount of information and filtering resources to find the target information.

Web-based learning is focused on learner-driven approaches and can be presented in multimedia formats, which allow learning to be interactive, engaging, and dynamic. Web-based learning delivers on the promise of increased individualisation of learning by offering participants a greater degree of control of their learning pace and options; however, the contrary can also occur. In the traditional setting, an effective teacher will be able to gauge the performance of their students, but a web-based education system may not be able to respond to the individual needs and concerns of the students [7].

Advancement in medical knowledge and feedback from medical students often cause professors and authors to amend and improve teaching materials and resources. With

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