Usage and Expectations of Web 2.0 Tools in E-Learning Platforms: A Study on Basic Medical Science Students

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Abstract. *This paper is based on a survey for analyzing the awareness of the students about Web 2.0 applications and their expectations during the integration of e-learning technologies. Major finding are wikis, instant messaging, media sharing, social networking and VoIP show high usage by major group of students, where very less usage of podcasts, social bookmarking, blogs, feeds is found. More students mainly want wikis, forums to be integrated to in e-learning system along with media/file sharing, streaming, chat rooms, and blogs and bookmarking.*

Keywords: User Expectations, E-learning, Web 2.0, Medical Education

1. Introduction

It is interesting to watch how Web 2.0 applications are changing educational technologies through several instances. University of Michigan did a latest study about the usage of their websites (Chapman and Varnum, 2007) and it shows a high time use of Web 2.0 applications of their students. The top five activities as ranked by average response (in descending order) were emailed, social networking, IM, reading/using wikis, reading blogs. Gras University of Technology Austria did a survey among their students and faculty to find out the usage of Web 2.0 and how it affects the University's learning environment (Safran et al., 2007). They found that most of Web 2.0 applications are scarcely used in courses and in self-organized learning activities. Only weblogs and wikis are frequently used Web 2.0 applications in learning processes. Another study of first year students from the University of Melbourne (Kennedy et al., 2006, Kennedy et al., 2008) shows that 76% of them use Internet for searching study related information and significant portion of them uses Web 2.0 applications.

It is very clear that Web 2.0 is changing all aspects of academic life including practice and training of Medicine. Academic Institutions, Hospitals, Libraries, Publishers, E-Learning Vendors, Search Engines, Media, literally all walks of life are implementing Web 2.0 technologies to serve the need of "*digital natives*" and "*digital immigrants*". According to Giustini (2006), Web 2.0 ultimately provides the opportunities of using software to create optimal knowledge building opportunities for doctors. He also provides a list of websites started in the early stages of Web 2.0 in medical practices and teaching.

White (2007) says that some of the most challenging outstanding issues in this area relate to administration, ownership, sustainability and assessment, which are more cultural (institutional and personal) rather than technical. It also suggests that the focus of further research should be on guiding and facilitating change rather than looking for purely technological solutions.

2. Background of this Study

American University of Antigua (AUA) College of Medicine is a US Offshore Medical School established in the year 2004 at Antigua, West Indies. Its students and faculty population comprises mostly Americans and Canadians with multi ethnic and religious culture. AUA started implementing latest IT application from the start of the University. Most of the students are in the Category of "*Digital natives*" or "*Y Generation*", born between 1980 and 1994 (McCrindle, 2006). Their familiarity and ease of ICT use because they spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age" (Prensky, 2001).

After finishing Basic Medical Science, students will go to various hospital locations in USA for continuing their next Semester and clinical rotations. Delivering the necessary learning materials and resources and interaction between faculty and students are becoming a challenge in terms of different locations. With this, AUA decided to improve its learning system with supplementing with e-learning facilities. Being integrated to the e-learning Systems, Web 2.0 tools are also going to play a major role in any e-learning platforms. Therefore there was a need to study the present student population before implementing the facilities, about their usage of Web 2.0 applications for learning and research purposes.

The future world of practice for the current medical student is rapidly evolving and the changes are already beginning to occur. The appropriate responses by medical educators are an increased awareness of the inevitable trend and acceptance of the importance of self-organized and personalized learning. The role of a medical educator will change but, as always, it will be concerned with how to enhance learning by considering the potential of the new technology (Sandars and Haythornthwaite, 2007). Web 2.0 applications are also creating new challenges for medical professionalism, where the scope is not well - defined in undergraduate medical education (Chretien et al., 2009).

Before implementing these technologies, it is very important that each institution should study the awareness and usage of these technologies by their users. The clear idea of user needs and how do they want to utilize these services should be analyzed carefully. Administrators need to gather evidences about the degree of usage of these emerging technologies. Based on this one should aim to develop and implement appropriate technological - tools in e-learning, where each learner will have a personalized learning system that is linked to a vast range of learning resources, containing both codified and tacit knowledge, and that is also adaptive to both the learner but also the wider learning community within which each learner is an integral part (Sandars and Haythornthwaite, 2007). Attwell (2007) identifies the basic paradigm shift from learners engaging with institutional provision and procedures to the institution engaging with the learner. He underlines the need for institutions to recognize the new cultures of learning and networking and change in institutional practice and procedures and in curriculum organization and pedagogic approach.

3. Methodology

A quantitative and non-experimental survey on basic medical science students has done to collect data. The questionnaire contained closed and structured questions with pre-defined choices, semantic differential scale questions and 2 open and unstructured questions. Questionnaire in print-format were given to students and the responses were collected by hand. The questions are framed by taking care of all ethical facts related to an academic research. Proper confidentiality and security are given to the data collected, and the identity of participants is protected. The data collected through the survey is analyzed and graphical representations are developed. 162 responses are received in response to questionnaire distribution to a group of 200 randomly selected students.

4. Data Analysis and Discussion

From the literature review, it has seen that there are many evidences of Web 2.0 applications in e-learning, medical education and medical practice. It is also found that students are using wikis, instant messaging, podcasting, social networking, and blogs for their medical education.

4.1 Age distribution
Out of 162, 101 respondents (62%) are in the age group of 21-25, 52 (32%) are in the group of more than 26 years and 9 (6%) are in the group of 15-20 group. A major portion of the sample group belongs to Y Generation or Digital natives, born between 1980 and 1994 (McCrindle, 2006)

4.2 Time share on Internet
On an average, 60 (37%) respondents spent 4-7 hours in a day on Internet, 46 (29%) spent 1-3 hours, 36 (22%) spent 8-12 hours and 20 (12%) spent more than 12 hours. This shows high use of Internet by the students, where only 29% spent less than 3 hours online.
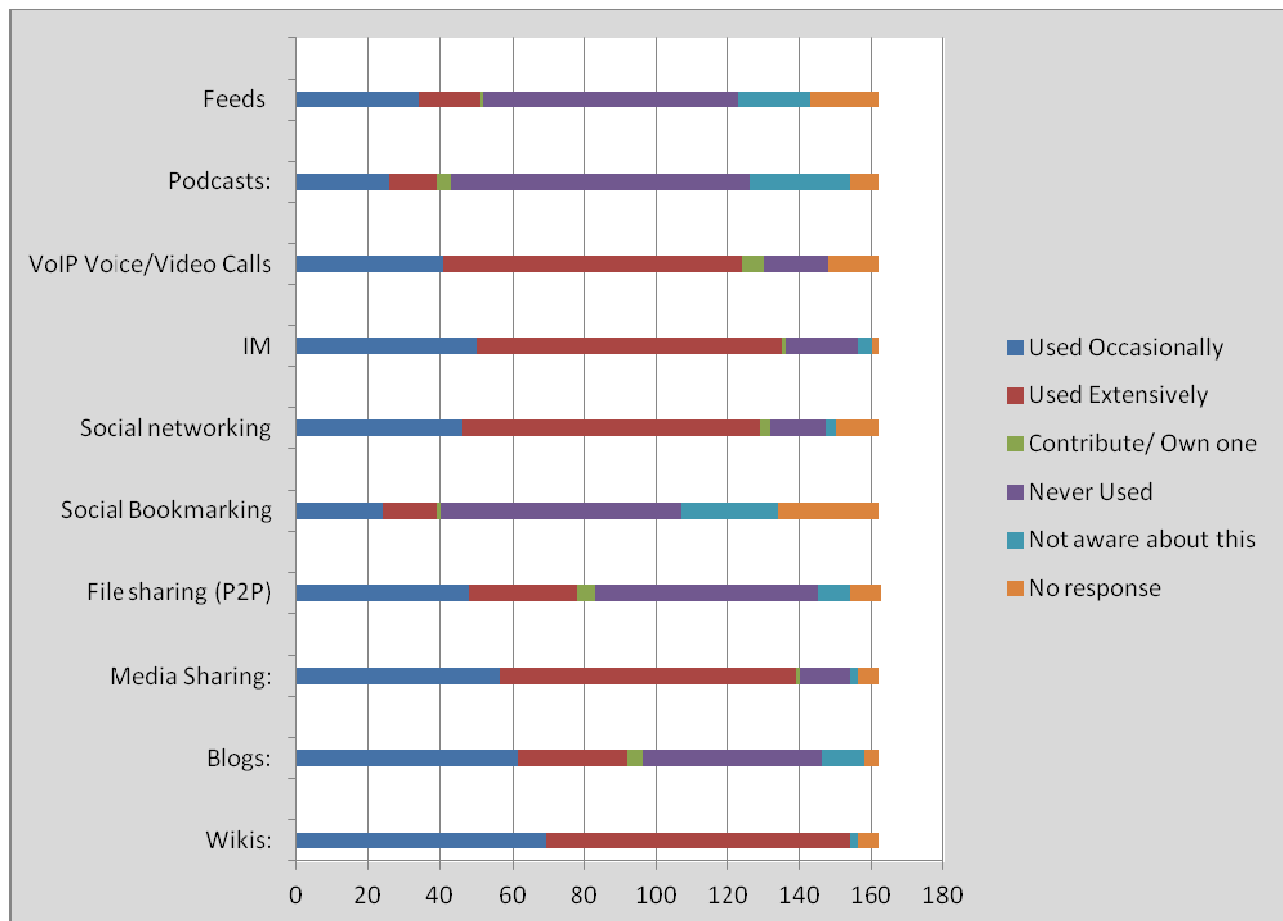
Usage of Web 2.0 tools for Medical education

4.3 E-resources usage for their Medical education
Question: What kind of resources do you use from the Internet for your Medical education?
It is interesting to note that 107 (66%) respondents use blog and wikis; portals and websites are used by 95 (59%); 92 (57%) respondents chat with peers through Internet; medical school department websites are used by 81 (50%); news and feeds are used by 66 (42%); e-Journals are used by 63 (39%); e-books are used by 56 (35%); library databases and resources are used by 49 (30%) and 15 (9%) of them use other resources such as; e-mail, access medicine, you tube, educational videos, magic jack, search engines, black board etc. This shows relatively high use and activities of Web2.0

applications by medical students as compared to traditional resources.

4.4 Usage of Web 2.0 tools
Among Web 2.0 tools used by medical students, following visualized graph will show how extensive these technologies are being used by the students.

Wikis, instant messaging, media sharing, social networking and VoIP are extensively used by major part of students. When we add students group who occasionally use these 5 technologies, we can clearly say that these are the technologies showing a positive trend in student's usage. But, very less usage of podcasts, social book marking need to be analyzed more, since these two technologies have high usage in medical practice and collaborative research. Blogs, feeds and file sharing are also have low usage among the sample group.

This data is closely matching with some of the previous studies, where Sandars, et al. (2010) find over 90 percent medical students using instant messaging and social networking sites. But this data is contradicting findings from Ward, Moule and Lockye (2010) where they found podcasting used by 32%, blogs by 44%, wikis 28% and social networking by 16%. If we compare with different studies (White, 2007), (Kennedy et al., 2006) the findings have minor variations due to region, non-promotion from the campus faculty, unawareness among students and non-availability of such systems in their e-learning platforms.

4.5 Usage of a course management (e-learning) system
Out of 162 respondents, 137 (85%) have used or using e-learning system for their medical education, 20 (12%) are not used and 5 (3%) did not respond to this question.

4.6 Availability of Web 2.0 features in course management systems
68 (42%) respondents told that the course management system they used has forums and discussion feature in it. Other features are 53 (32%) wikis, 63(30%) media/file sharing, 38(23%) chat rooms, 26 (16%) blogs, 22 (14%) streaming, 11 (6%) bookmarking and 39 (24%) told they did not have any web.20 features in their course management system. Most the e-learning products are integrating such Web 2.0 tools and support blended teaching.

**4.7 Expectation of Web 2.0 feature(s) in an E-Learning System**
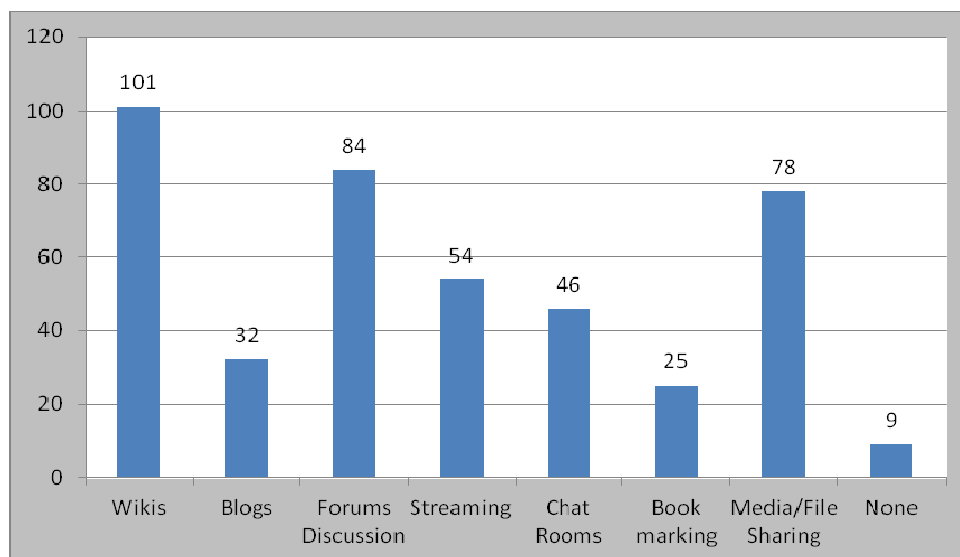
101 (62%) respondents expect wikis function in an e-learning system, 84 (52%) expect forum and discussion, 78 (48%) expect media/file sharing, 54 (33%) expect streaming, 46 (28%) expect chat rooms, 32 (20%) expect blogs, 25 (15%) expect book marking and 9 (5%) respondents do not expect any Web 2.0 features. It is interesting to note that wikis,

forums and discussions and media file sharing are wanted by most of the students, and shows its popularity among them.

4.8 Reasons for Web 2.0 tools are useful in learning
96 (59%) respondents agree that Web 2.0 tools will support new learning, 91 (56%) believe that they are easy to use and find, 88 (54%) agree that they stimulate collaboration and discussion, 81 (50%) believe that they provide more information, 52 (32%) believe that they provide better information, 38 (23%) believe that they encourage content creation and only 20 (12%) believe that they enhance the face-to-face learning.
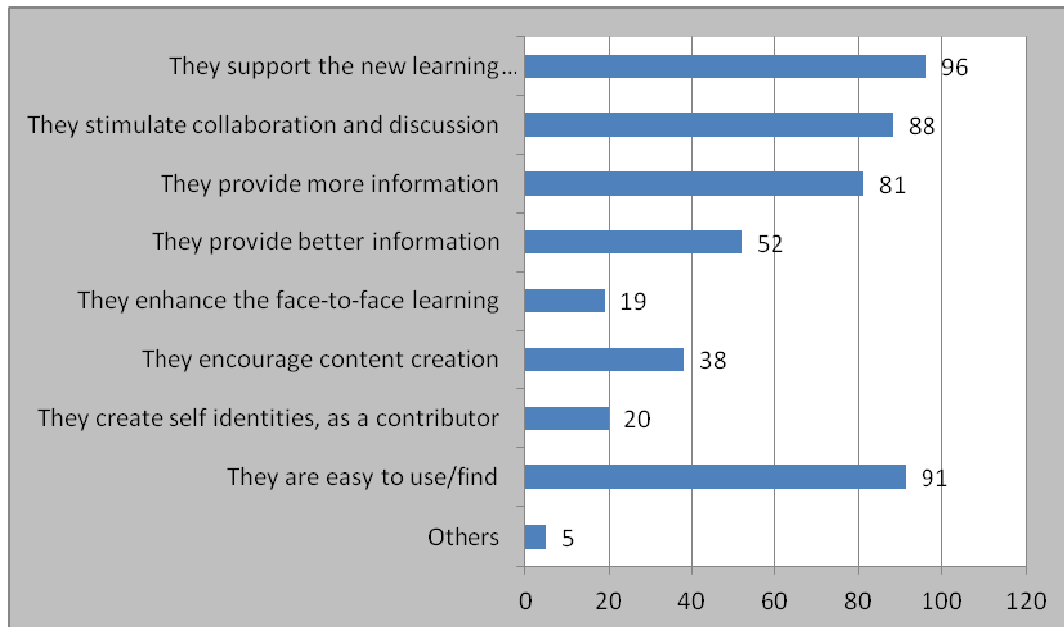
4.9 Evaluation of information from blogs, wiki, podcasts etc.
Question: Do you evaluate a blog, wiki, podcasts etc based on its authority, reliability, authenticity etc, before using the information for your course works, assignments, research projects etc?

92 (58%) respondents evaluate the information from wikis, blogs, podcasts etc before they use them for their course assignments and research works, 53 (34%) do not evaluate and 12 (8%) respondents did not answer this question. It should be a matter of concern for the educators to have clear guidelines and policies in evaluating the information from Web 2.0 resources (Haigh, 2010b, Burke and Snyder, 2008)

4.10 Reasons preventing from using the information from Web 2.0
66 respondents (41%) found limited information as the reason preventing them using information from Web 2.0 tools, 45 (28%) found un-professional content, 43 (27%) found non-authoritative information, 40 (25%) found irrelevant information or information overload, and 34 (21%) found the non-acceptance from faculty or school are the reasons. 3 respondents found other reasons such as "*youtube is blocked*", "*internet not used much for study*" etc. Posting of unprofessional online content, especially via Web 2.0 platforms is a matter of concern and there are no adequate policies having in place as well, even in U.S. Medical schools (Chretien et al., 2009).

4.11 Citing practice of the information from Web 2.0 tools
Question: When you use the information from a blog, wiki, podcasts etc for your course works, assignments, research projects, do you cite (provide reference) them properly?

98 (62%) respondents said that they cite the references of information taken from Web 2.0 platforms, but 46 (29%) of them do not cite and14 (9%) respondents did not respond to this question. A considerable minority is still do not

practice citations or giving credit to the original author and this leads to plagiarism and unethical situations. Masters and Ellaway (2008) suggest plagiarism detection systems to be incorporated even in Web 2.0 environments.

4.12 Willingness to contribute share in Web 2.0 environments
Question: Are you willing to contribute/upload/share OR just to read/listen/download in Web 2.0 environments?

113 (70%) respondents are willing to contribute or share information in Web 2.0 environments, 40 (25%) would like to read or listen and 9 (5%) did not respond to this question. This willingness is a positive trend, especially, the emphasis on student authorship and debugging of sophisticated academic knowledge bases are the powerful features of Web 2.0 tools (Bratsas et al., 2009).

4.13 Awareness of Web 2.0 usage in medical practice and CMEs
Question: Do you know that Web 2.0 tools are used by physicians and hospitals in medical research and CME?

It is interesting to note that 87 (54%) respondents are NOT aware about Web 2.0 usage in medical practice, research and continuing medical education programs, where only 57 (35%) knows about it and 18 (11%) did not respond to this question. The wide use of these emerging technologies in continuing medical education/professional development, patient education (Boulos and Wheelert, 2007) and on all areas of medical practice (Hughes et al., 2008) is already known, and basic medical science students should be aware about it.

4.14 Open Ended Questions
Q.1 When comparing with traditional resources (faculty notes, textbooks, journals etc), what are your overall opinion about the information available in Web 2.0 platforms?

Most of the responses are very common, general, specific and short answers. As compared to traditional resources, generally they found that the information from Web 2.0 platforms are easy to access, easy to search, convenient, informative, useful, fastest, great, helpful, important, good, effective, awesome, concise, direct, efficient and so on.

Some of the responses suggest that one must be skeptical when using the information and should be used wisely. The Main concerns of the critical views are about the reliability of information, the need for evaluation etc. Some students clearly say that text books and faculty notes are more relevant and will not be replaced by technologies. Most of the opinions tend to be saying that these resources can be a good supplementary resource, if evaluated and wisely used.

Q.2 What are your comments about effective use of Web 2.0 tools in medical education OR practice?

The comments worth mentioning or critical are mainly about the reliability of information, the need for evaluation etc. Some students say that medical school and faculty should clearly accept the practice of using the information from Web 2.0 tools. Blocking of such tools, like You Tube, is opposed by students and asking for a more open approach from the administrators. There are opinions pointing out to the necessity of implementing these technologies to e-learning platforms, such as a blackboard. They demand streaming videos of faculty lectures and podcasts kind of blended approach.

5. Major Findings

The study revealed the high use of Internet by basic medical science students and a relatively high use and activities of Web 2.0 applications. Among Web 2.0 applications, wikis, instant messaging, media sharing, social networking and VoIP show high usage by major group of students. Even though a positive trend is visible here, very less usage of podcasts, social bookmarking is also found. This trend is against to high usage of podcasts and collaborative bookmarking practices, especially in medical practice. Low usage of blogs, feeds and file sharing is also found.

85 percent of students have used or using e-learning system for and forums and discussion were highly noticed by students in their e-learning systems, followed by wikis, media/file sharing, chat rooms, blogs, streaming and bookmarking. Respondents expect most of the Web 2.0 functions to be integrated into a technologically advanced e-

learning system. Students want medical school and faculty to clearly accept the practice of using the information from Web 2.0 tools. Students feel there is a need of a more open approach from the administrators and are against to blocking of Web 2.0 tools, like YouTube, Facebook etc. There are opinions pointing out to the necessity of implementing these technologies to e-learning platforms, such as blackboard at American University of Antigua. Streaming videos of faculty lectures and podcasts kind of blended approach are the main demands.

More students believe Web 2.0 tools will support new learning, easy to use and find, stimulate collaboration and discussion, provide more information, and provide better information. Few students also believe that these tools encourage content creation and enhance the face-to-face learning. The information from wikis, blogs, and podcasts etc. are evaluated only by 58 percent students, before they use them for their course assignments and research works. Major group of students, 62 percent, provide proper citations for the information taken from Web 2.0 platforms. Knowingly or unknowingly a considerable minority is still do not practice citations or giving credit to the original author(s)

When we look at a broader perspective of Medicine 2.0, it is interesting to note that 54 percent basic medical science students are NOT aware about Web 2.0 usage in medical practice, research and CMEs. Only 35 percent knows about the wide usage and 11 percent did not respond to this question. Students believe that textbooks and faculty notes/presentations are more important, but Web 20 tools can be a good supplement, when they are used wisely.

6. Conclusion

The literature review and the study revealed several needs and expectations of the medical students and by medical practitioners, even by community as a whole, in the age of Web 2.0 technology advancements. These tools attract the largest portion of Internet users, the youngsters and growing especially in medical fields. E-learning platforms are inflexible in a larger way to accommodate the possibilities of building credible resources through communities, and contrast with the user-centered approach of Web 2.0 services (Craig, 2007).

Innovative solutions at institutional level in a Web 2.0 environment are the need of the hour. It includes rethinking the underlying architecture of the present e-learning models. Students should be provided with the facilities in a format more familiar to them and used by most of them. Educators and faculty need to understand that these activities will add value to their teaching and learning process. Faculty also should be trained with a new emphasis as learners in a rapidly changing environment. Virtual Learning Environments supportive curricula, social media policies, e-professionalism for students, feedback systems and related possibilities still need to be fully identified and explored in various settings/scenarios at the campus level. Teaching and learning institutions should be equipped for the future with the appropriate technology and allow their students to achieve their maximum potential. The immediate calls are for integrating wikis, instant messaging, audio/video streaming, social collaborations, podcasts and Web 3.0 based semantic content present e-learning systems.

While implementing Web 20 or Web 3.0 features, the aim should be to develop and implement tools in e-learning platforms and each learner should have a personalized learning system linked to a vast range of learning resources, social media and collaboration, where each learner and his/her contribution is an integral part (Sandars and Haythornthwaite, 2007, Vijayakumar, 2008). Researches in Web 2.0 applications in learning tend to be very descriptive failing to identify and discuss the pedagogical theories and models that support and enhance the exploitation of Web 2.0 tools in (e)-learning environments, (Sigala, 2007), which needs attention and further research.

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