

Research Article

The Use of Web 2.0 Technologies in Dentistry Education: Students' use and prospective applications

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Abstract: Wiki's, blogs and podcasts are identified as web 2.0 technologies that are highly used by medical professionals. The present study aimed to explore the potential use of web 2.0 technologies and their advantages by undergraduate dental students at Kerman (Iran) University of Medical Sciences during 2010-2013. This descriptive-analytical cross-sectional study was performed on 259 undergraduate dental students. Data was collected by using a questionnaire. The questionnaires were divided in three main sections: in section 1, participants were invited to fill in their demographic information. Then, in section 2 they were asked to rate their use of web 2.0 technologies according to a list of 7 pre-specified technologies, and in sections 3, participants were invited to rate the application of web 2.0 technologies in education, research, entertainment and communication accordingly. For the data analysis, we prepared a datasheet in SPSS version 21.0. In the results showed that Students mostly obtained the information through web search engines like Google (90%), scientific databases like PubMed (29%), web URLs (20%) and the libraries' websites (8%) accordingly. Only 7% of the dentistry students knew the concept of web 2.0 inclusively, 27% were almost familiar with the concept and 66% had no information about the web 2.0 technologies. In conclusion According to our findings, social networks and media sharing services are the most frequently used services by dental students of Kerman (Iran) University of Medical Sciences.

Keywords: Web 2.0 technologies, Dental Students, Education.

INTRODUCTION

To date, medical education has experienced gradual developments during the last decades. In particular, computer assisted instruction (CAI), e-learning, interactive websites currently known as web 2.0 content have brought significant changes to the education of medical profession throughout the world[1]. According to the JISC definition, "Web 2.0 encompasses a variety of different meanings that include an increased emphasis on user-generated content, data and content sharing and collaborative effort, together with the use of various kinds of social software, new ways of interacting with web-based applications, and the use of the web as a platform for generating, re-purposing and consuming content." [2] This definition refers to web 2.0 as the internet resources that are easily accessible, modifiable and publishable by any online user. Indeed, "wiki's", "blogs" and "podcasts" are identified as web 2.0

technologies that are highly used by laymen as well as medical professionals [1].

The use of Web 2.0 technologies in the education of medical profession has been substantially increased over the recent years [3-7]. Many universities and scientific journals run their YouTube channels and thousands of users followed their uploaded content through these media. The use of Wikis and Blogs in teaching and learning process has received growing attention and several efforts have been made to evaluate the impact of these social media on the quality of teaching and learning outcomes in medical settings [3, 4, 7-10]. While the use of social media and web 2.0 technologies in medical education has been repeatedly investigated and the results yielded the potential advantages of these technologies to students and medical professionals; the information on application of these technologies in dentistry has remained limited [11, 12] and little evidence supports the beneficial aspects of

web 2.0 technologies in the education of dentistry. In an attempt to address these challenges, the present study aimed to explore the potential use of web 2.0 technologies and their advantages by undergraduate dental students at Kerman (Iran) University of Medical Sciences during 2010-2013.

METHODS

Setting and participants

The sample was drawn from a study population of dentistry students Kerman University of Medical Sciences (a large Iranian medical university). A total of 4 graduating cohorts, comprising about 285 students, were selected for study. Surveys were distributed during January 2010-March 2013. Of all 285 students invited to participate in the study, 259 ultimately returned the questionnaires, giving a response rate of 87.8%. Oral consent obtained from all participants. Ethical approval has been granted by the Kerman University of Medical Sciences Research Ethics Committee.

Design

A structured, self-administered questionnaire was developed using existing literature and through collaboration with three domain experts and advisors in the field of medical education. According to received comments from these experts, a range of questions were added to the questionnaire. Therefore, the overall content of the questionnaire covered two broad sets: knowledge of using web 2.0 technologies and their application in education/ research/ entertainment/ communication including 11 pre-specified questions. The content of the questionnaire was then pretested in a pilot study involving 15 students to assure the clarity, lack of ambiguity and internal consistency of the scale.

The questionnaires were divided in three main sections: in section 1, participants were invited to fill in their personal information, including their age, gender and regular use of internet websites. Then, they were asked to rate their use of web 2.0 technologies according to a list of 7 pre-specified technologies

(including blogs, podcasts, wikis, social networks, internet telephony, instant messaging, social bookmarking and media sharing). In sections 3, participants were invited to rate the application of web 2.0 technologies in education, research, entertainment and communication accordingly.

Statistical analysis

For the data analysis, we prepared a datasheet in SPSS version 21.0. Descriptive statistics were used to summarize the data.

RESULTS

Over half of the participants were female (60.6%). Of all 259 participants, 86.5 % were undergraduate dentistry students and the rest were dentistry residents. About 35% of students reported using computers, 76% using laptops, 31% using MP3/Media Player and 59% reported using smart phones. Almost half of the students (45%) accessed the internet less than 3 hours daily, 18% more than 3 hours daily, 8% once a week, 16% two to three times a week, and the remaining 13% reported rarely used the internet.

Students mostly obtained the information through web search engines like Google (90%), scientific databases like PubMed (29%), web URLs (20%) and the libraries' websites (8%) accordingly. The students were also used phone (81%), Email services (35%), chat rooms (15%) and discussion groups (12%) for communication purposes. Only 7% of the dentistry students knew the concept of web 2.0 inclusively, 27% were almost familiar with the concept and 66% had no information about the web 2.0 technologies. Students perspectives on the contribution of web 2.0 technologies in the education of dentistry profession are summarized in Table 1. Besides prospective applications of web 2.0 services has been identified through students' ideas in Table 2. Knowledge and use of web 2.0 technologies according to students' perspectives is illustrated in Figure 1 and Figure 2 accordingly.

Table 1: The contribution of web 2.0 technologies to dentistry education

Service	Very low	low	middle	much	very much
Blogs	10	26	25	24	15
Podcasting (iPod)	24	24	23	29	9
Wikis (e.g. Wikipedia)	23	23	25	18	11
Social Networks (e.g. Face book)	26	30	20	10	14
Internet Telephony (e.g. Skype)	28	27	21	13	11
Instant messaging (e. g. MSN messaging)	24	30	19	17	10
Social bookmarking (e.g. del.licio.us)	23	29	25	10	13
Media sharing (e.g. You Tube)	25	31	23	12	9

Table 2: The contribution of web 2.0 technologies to research, education, entertainment and communication

	Service	Very low	low	middle	much	very much
Education	Blogs	33	29	15	11	12
	Podcasting (iPod)	31	28	16	14	11
	Wikis (e.g. Wikipedia)	32	29	15	13	11
	Social Networks (e.g. Face book)	29	27	14	16	14
	Internet Telephony (e.g. Skype)	30	28	15	14	13
	Instant messaging (e. g. MSN messaging)	30	28	14	16	13
	Social bookmarking (e.g. del.licio.us)	32	29	14	14	10
	Media sharing (e.g. You Tube)	31	30	13	15	11
Research	Blogs	33	28	16	10	13
	Podcasting (iPod)	31	27	15	15	12
	Wikis (e.g. Wikipedia)	29	30	16	14	11
	Social Networks (e.g. Face book)	30	29	16	12	13
	Internet Telephony (e.g. Skype)	29	31	13	17	10
	Instant messaging (e. g. MSN messaging)	30	28	14	16	13
	Social bookmarking (e.g. del.licio.us)	32	29	14	14	10
	Media sharing (e.g. You Tube)	31	30	13	15	11
Entertainment	Blogs	32	29	15	11	13
	Podcasting (iPod)	30	28	17	12	12
	Wikis (e.g. Wikipedia)	29	31	16	17	13
	Social Networks (e.g. Face book)	30	29	16	12	13
	Internet Telephony (e.g. Skype)	30	30	17	15	8
	Instant messaging (e. g. MSN messaging)	33	29	16	11	11
	Social bookmarking (e.g. del.licio.us)	32	31	15	13	9
	Media sharing (e.g. You Tube)	31	33	12	14	10
Communication	Blogs	29	30	15	13	11
	Podcasting (iPod)	29	33	16	12	10
	Wikis (e.g. Wikipedia)	32	31	15	14	8
	Social Networks (e.g. Face book)	29	27	14	16	14
	Internet Telephony (e.g. Skype)	30	28	15	14	13
	Instant messaging (e. g. MSN messaging)	30	28	14	16	13
	Social bookmarking (e.g. del.licio.us)	32	29	14	14	10
	Media sharing (e.g. You Tube)	31	30	13	15	11

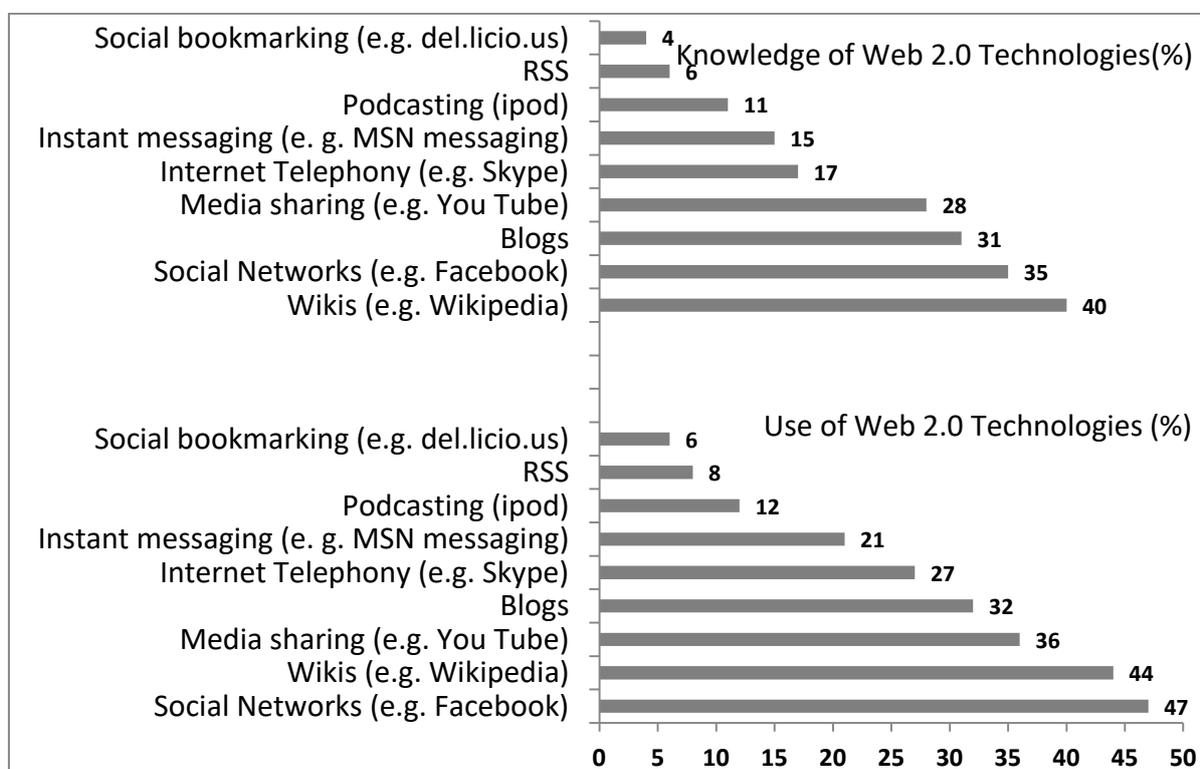


Fig-1- Knowledge and use of web 2.0 technologies according to dentistry students' perspectives

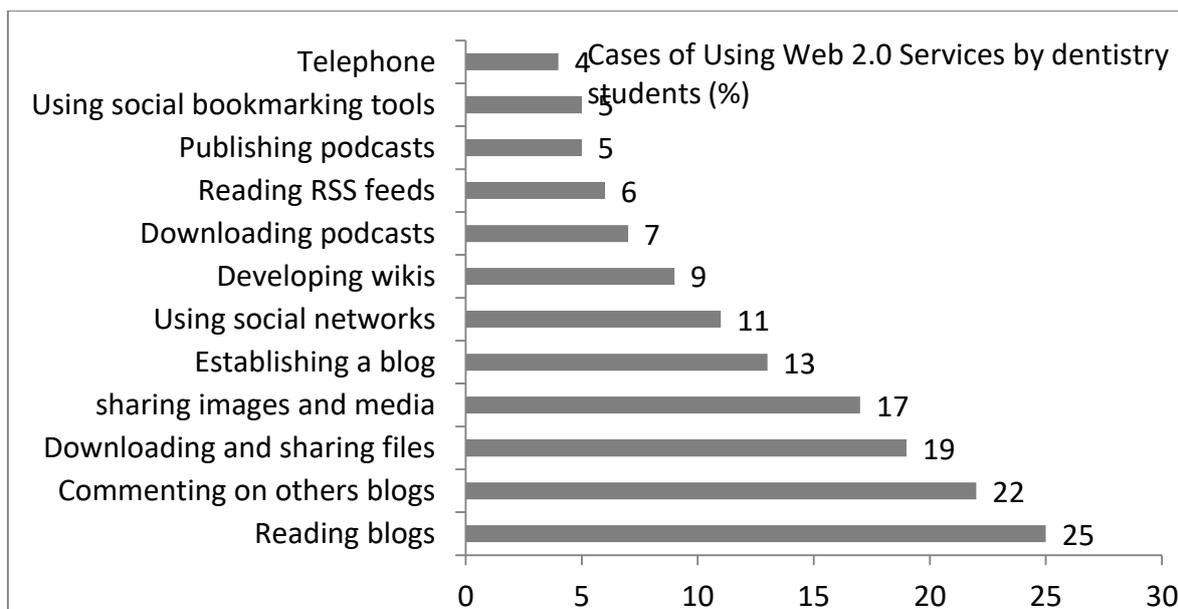


Fig-2: Cases of using web 2.0 services by dentistry students

DISCUSSION

This study examined the use of web 2.0 technologies in the education of dentistry profession. Undergraduate students and residents of dentistry have been questioned about the current experience and prospective applications of web 2.0 technologies. Our results yielded that social networking and media sharing websites were the most frequently used services among the wide range of web 2.0 applications and technologies. Although the students' knowledge on the concept of web 2.0 has been found limited among the students, their usage patterns revealed that students routinely use these services during their daily life.

The application and use of web 2.0 technologies have been frequently explored and the results provided evidence supporting the great advantages of these technologies for teaching and learning process in medical sciences[2, 4, 8, 9, 13-15]. However, the information on the use of web 2.0 technologies in dentistry has been inadequately investigated. In this regard, there is a piece of evidence providing current justifications and application of web 2.0 technologies in the context of dentistry and oral implantology [1, 11, 16, 17]. According to these experiences, web 2.0 technologies such as YouTube and similar media sharing websites have favourable capacity and value in complementing the education of dentistry educators but not as sole source of education[1].

Previous studies have identified web 2.0 technologies consistent with the modern educational theories like Vygotsky's Socio-constructivist learning theory[14]. According to this theory, significant learning occurs during a social activity through interactions with the peers and the environment[14]. This evidence supports the use of web 2.0 technologies

during the learning process to develop active learning through interactive online opportunities.

While the application of web 2.0 technologies requires teachers and students to have some information technology skills, current evidence indicates the individuals' low levels of confidence using web 2.0 technologies such as twitter and wikis[14, 18]. Besides, several other challenges have been suggested to influence the use of these technologies including lack of digital skills and time, infrastructure issues and lack of administrative and technical support[14, 18]. Computer anxiety has been proposed as another major barrier in using web 2.0 technologies[19]. Adaption of emergent technologies by experienced educators in one hand, and the integration of learning technologies to overcome this resistance on the other hand highlight ongoing concerns about humanistic dimensions of web 2.0 technologies. In response to these challenges, establishing regular schedule of professional development trainings for educators, developing online tutorials and learning resources with examples of use have been recommended as potential solutions[14].

According to Steve Wheeler's statement "If you believe that technology can be used to engage students, to enhance or extend learning or to enrich the life of your community of practice then go for it. If you can't see any way technology can do any of these things, then close the catalogue; leave the store, walk away. There is nothing for you to see here." [20]

CONCLUSION

Our findings indicated the current use of web 2.0 technologies and their prospective application for research and education of dentistry profession. According to our findings, social networks and media sharing services are the most frequently used services

by dentistry students. While current evidence supports the advantages of integrating web 2.0 technologies with the teaching and learning process, several barriers to adaption of these technologies have been raised.

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