

Instant Messaging in Dental Education

Khatoon, Binish; Hill, Kirsty; Walmsley, Anthony

License:

None: All rights reserved

Document Version

Publisher's PDF, also known as Version of record

Citation for published version (Harvard):

Khatoon, B, Hill, K & Walmsley, A 2015, 'Instant Messaging in Dental Education', *Journal of Dental Education*, vol. 79, no. 12, pp. 1471-1478 . <<http://www.jdentaled.org/content/79/12/1471.abstract?sid=0e97be09-ddef-4a70-b046-e82c59cb23c6>>

[Link to publication on Research at Birmingham portal](#)

Publisher Rights Statement:

Checked for eligibility: 11/01/2017

<http://www.jdentaled.org/content/79/12/1471.abstract?sid=0e97be09-ddef-4a70-b046-e82c59cb23c6>

Copyright © 2017 by the American Dental Education Association

Journal of Dental Education December 1, 2015 vol. 79 no. 12 1471-1478

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.

Instant Messaging in Dental Education

Binish Khatoon, MSc, PhD; Kirsty B. Hill, PGCE, MSc, PhD; A. Damien Walmsley, BDS, MSc, PhD, FDSRCPS

Abstract: Instant messaging (IM) is when users communicate instantly via their mobile devices, and it has become one of the most preferred choices of tools to communicate amongst health professions students. The aim of this study was to understand how dental students communicate via IM, faculty members' perspectives on using IM to communicate with students, and whether such tools are useful in the learning environment. After free-associating themes on online communication, two draft topic guides for structured interviews were designed that focussed on mobile device-related communication activities. A total of 20 students and six faculty members at the University of Birmingham School of Dentistry agreed to take part in the interviews. Students were selected from years 1-5 representing each year group. The most preferred communication tools were emails, social networking, and IM. Emails were used for more formal messages, and IM and social networking sites were used for shorter messages. WhatsApp was the most used IM app because of its popular features such as being able to check if recipients have read and received messages and group work. The students reported that changes were necessary to improve their communication with faculty members. The faculty members reported having mixed feelings toward the use of IM to communicate with students. The students wished to make such tools a permanent part of their learning environment, but only with the approval of faculty members. The faculty members were willing to accept IM as a communication tool only if it is monitored and maintained by the university and has a positive effect on learning.

Dr. Khatoon is a Research Fellow, School of Education, University of Birmingham; Dr. Hill is Senior Lecturer in Dental Public Health and Behavioral Science, School of Dentistry, University of Birmingham; and Dr. Walmsley is Professor of Restorative Dentistry, School of Dentistry, University of Birmingham. Direct correspondence to Dr. Binish Khatoon, Jubilee Centre for Character and Virtues, School of Education, University of Birmingham, 12th Floor (West) Muirhead Tower, Edgbaston, Birmingham B15 2TT, United Kingdom; B.khatoon@bham.ac.uk.

Keywords: dental education, dental students, social media, technology, communication, instant messaging

Submitted for publication 11/6/14; accepted 6/4/15

A constant challenge is anticipating the next technology that students will adopt to help with their education.¹ There has been research focussing on the use of the Internet in dental education,²⁻⁵ but the advances in technology are challenging traditional email communication as students adopt tools such as instant messaging (IM). An IM service is an app or tool that allows users to communicate with each other when online at the same time. It is generally used via Internet connections that are free of any charges. Users can create specific contact lists, and it also allows them to sort their conversations into groups of their own choosing.⁶ The most popular feature is the ability to check to see who is online and who is not. This feature has a distinct advantage over traditional email as it instantly allows users to know if the other person has read and received the message.

Social media technologies like IM have improved communication immensely,⁷ and this naturally impacts teaching and learning with dental students. IM is now as much of a popular student communication tool as emails.^{8,9} Students may use IM up to 16.3 hours per week.¹⁰ Students are chatting to each other instantly, and long conversations are put through with a few short cut words on instant messaging apps; this is also creating social identities. Social networking sites such as Facebook can be used by students to

develop new campus-based relationships.¹¹ Through IM platforms such as WhatsApp, users are communicating with contacts whom they already know. Facebook can be used to post messages on other user's "walls," view pictures, and virtually poke one another.¹² WhatsApp is a little more personal as users have to share mobile numbers to communicate, and it includes a variety of functions such as audio files, text messages, video files, and attached images.¹³

Views on the academic use of IM are generally negative and may be the result of the limited number of studies focussing on types of IM tools.¹ Spending time on the Internet and getting distracted are often cited by researchers as a criticism to linking web-based tools to student activity.¹⁴ Students will attempt to multi-task, and examples include texting in the class or IM through assignments.^{15,16} In dentistry, such forms of communication are occurring informally, but the impact has not been assessed in a formal manner.

Learners are changing and adapting quickly to new technologies, and this has an impact directly on educational practices.¹¹ Faculty members could benefit from using these new tools, which may help bridge the gap between the faculty member and the learner, therefore benefitting everyone.¹¹ Some of the educational benefits of using IM platforms

include organizing group activities, discussing issues, obtaining quick information such as links to helpful websites, sending files,¹⁷ faculty member and student in-person interaction concerning the course and students' personal issues, elimination of the barriers between faculty members and students, and informal communication between students.¹⁸ The aim of this study was to understand how IM is used by dental students to communicate with each other and whether such tools are useful in their learning space. In addition, the study aimed to understand faculty members' attitudes towards the use of IM to communicate with students.

Methodology

The project received ethical approval from the University of Birmingham's ethics committee. After free-associating various themes on online communication, two draft topic guides for the interviews was designed. The aim of the interviews was to focus on mobile device-related communication activities. This research follows guidelines of conducting qualitative research.¹⁶ The topic guides included all the themes decided on when putting together questions. These included use of the Internet for personal reasons and dental studies; first and second choice of device used to connect to the Internet and search for information; most used Internet communication tool; ways of communicating with different groups of people; improvements needed when communicating with faculty members; phone brand; kind of apps used by students (study, personal, communication); mobile computing/communication tools engaged on smartphones; how often the devices access the Internet; most preferred place when connecting to the Internet; barriers when connecting to the Internet to search for information; students' perspectives on the term "evidence-based apps"; General Dental Council (UK) ethical standards in relation to social networking; how students trust information on the Internet; and any extra comments not covered elsewhere.

For the purpose of this article, only questions related to communication are discussed. The interviews with students included questions on most used Internet communication tools, ways of communicating with different groups of people, improvements needed when communicating with faculty members, and any concerns students may have regarding IM. The interviews with faculty members focussed on understanding their perspectives on improvements

needed when communicating with students and the use of instant messaging to communicate with them.

For participation in the one-to-one interviews, students' and faculty members' consent was sought before and during the interview. They were assured that their answers would remain confidential and their names and information would not be used or displayed. A total of 20 students and six faculty members agreed to take part in the interview process and were recruited via email. Only students who took part in the previous survey were asked to be part of the interviewing process. Students were selected from years 1-5, and the aim was to have students from each year group. This was achieved by making students aware of the study as a whole class, and anyone who wanted to participate left his or her name and email address. Faculty members were asked to participate in the study through emails and face-to-face meetings.

The interviews were recorded with a digital voice recorder (Olympus VN-713PC) to avoid missing any points and also to prevent interviewee distraction. Once the question was asked, students and faculty members were given time to provide a detailed answer if they so wished. There were no time limits on the interview, and each lasted up to half an hour. At the conclusion of the interview, students and faculty members were given a chance to discuss areas that had not been covered during the interview.

The information gathered during the interview was saved on a voice recorder. The voice memos were then organized on a laptop by taking out the interviews and sorting them into different folders. Students were given IDs that identified their gender, age, and year of study. Faculty members' IDs identified their age and gender. It was very important to ensure that the ID for both students and faculty members did not lead back to them and identify them. For this reason, the job detail for each faculty member was not disclosed. The interview recordings were then transcribed individually word for word into scripts. The transcripts were used to highlight codes and categories, with the main themes being categorized again, using a qualitative data analysis computer software NVivo.

Results

Student Interviews

Of the student sample (n=20), all 20 had access to the Internet. At the start of the interview, the

students were asked to give more information about their background including year of study, age, and if they had access to the Internet. This question allowed students to get more comfortable with the interview process. Table 1 shows the demographic data of students interviewed in order of year. All students but one were interviewed at the University of Birmingham School of Dentistry; that one was interviewed at the main campus of the University of Birmingham.

All students chose emails, social networking, and instant messaging as their first choices of communication. There was no difference in place of use (home or dental school). Of the 20 students, 11 chose emails as their first choice, six chose social networking, and three chose instant messaging. Students were asked to give explanations about their choices. For emails, many students said that laptops were best for typing long and formal emails, whilst writing short emails and quickly checking them were best done on smartphones and iPads. One student commented, “Sometimes you can’t be bothered to take out iPad to look at it, so I use phone, and if I have big files to download, I use iPad and for a quick glance it’s the phone” (ST16).

One student commented that smartphones have helped her reach her emails much quicker than on her laptop. She explained, “I don’t carry my laptop around all the time, and I feel with emails you have to check regularly. I feel before the smartphone I used to miss out on things such as first-come first-serve, and by the time I’d get home I’d already missed out and it was too late. So I feel the smartphone has definitely helped me” (ST20).

All students who mentioned instant messaging referred to the communication app WhatsApp. Instant messaging was preferred on smartphones by all students, and one student explained that he instantly messaged on his computer tablet also. He explained how he managed to message the same way on both smartphone and computer tablet: “I use the ‘tap talk app,’ which is a communication app that lets you sync two devices via Bluetooth so you can essentially type on one and get the other one to send it for you” (ST6).

To communicate with each other, some students used emails as they did not have a close friendship, but most of the students used instant messaging. WhatsApp was used a lot to undertake group work and share files for their dental studies. One student commented, “We use instant messaging and do group and we like to do group presentations” (ST15).

Table 1. Demographics of students interviewed

Year of Study	Number of Students		Age Range
	Male	Female	
Year 1	3	3	18-19
Year 2	1	3	19-20
Year 3	2	2	20-22
Year 4	1	1	21-23
Year 5	1	2	22-23

Another student again explained how WhatsApp is used for group work in the dental school: “We have I think 6 groups per year, so . . . we have our own WhatsApp group and someone will always reply” (ST13). Facebook messaging was another popular way to communicate with fellow students for group work. All 20 students said they communicated with faculty members through emailing.

The dental students were asked to think of ways that may improve the way they communicate with faculty members if they thought improvements were needed. Students said that they wanted to communicate with their faculty members through instant messaging if possible in the future. The main reason for this was because it would be more instant and sometimes they cannot tell if the faculty member has received or read their emails, whereas it is possible with instant messaging such as WhatsApp. Three students said that emailing was adequate for communicating with faculty members and two students said they needed more face-to-face meetings. One student noted that just as he communicated with fellow students through Facebook, maybe faculty members could also be contacted the same way. He suggested, “It sounds bad, but if they were on Facebook or a way to communicate with them through Facebook, I think it would be easier because you wouldn’t have to search through the university emails or anything and it would be fast and instant and can be used on any device. Whereas I cannot send emails on my phone but only receive. WhatsApp would be better than Facebook as it is instant” (ST12).

Instant messaging was mentioned by all of the students at some point, and instantly messaging their faculty members was a very popular idea. One commented, “If students and faculty members were happy, WhatsApp would be good so that you know they have received the message” (ST16). Another suggested, “Faculty members should get WhatsApp because it’s instant. Obviously they might get annoyed, but if messages are coming through and if

you're on the same kind of level, it should be ok. Emails are more formal, and WhatsApp is more informal. That's probably why they don't do that, but if you have a question for a faculty member, instant messaging is the best way" (ST5).

Although the majority of students suggested instant messaging and Facebook messaging, three students noted it may be too personal and said they may feel uncomfortable. One student said that the new smartphones and tablets allowed him to access emails instantly anyway. He explained, "Text messaging would be good, but the idea of having a work phone and personal phone, it could be hard work but I've seen people do this. Emails are convenient too. Especially with the new mobiles, they are much more instant, so the new mobile phone devices seem to deliver email messages more instant and work well" (ST1).

Faculty Member Interviews

All six faculty members interviewed had access to the Internet. At the start of the interview, they were asked to give more information about their background including age and if they had Internet access. As with the students, this question allowed them to get more comfortable with the interview process. The dental subjects taught by the faculty members are not disclosed as this could identify them. Table 2 shows the demographic data of the faculty members who were interviewed. All were interviewed at the University of Birmingham School of Dentistry.

Faculty members were asked to think of ways that could improve communication with students other than emails. All explained that the problem with emailing students is that they are very slow in reading and responding to the emails. Two faculty members felt that more face-to-face meetings would help them communicate with students rather than electronic tools. Although one noted that emails are slow, he did not like the idea of text messaging or using his smartphone to message students, as he did not

feel comfortable using his private phone number this way. Similarly, another faculty member expressed that there was no need for change and that emails set a good boundary between faculty members and students. "I would be happy for some members of staff to be contacting them on things like instant messaging or text messaging," he explained. "However, I think the students feel that you know that teaching and work is separate and email helps maintain the boundary" (F4).

Some faculty members were willing to use IM services to stay in touch with students, whereas others were not keen on this idea. Even though instant messaging was something that some faculty members would consider, they expressed concerns and suggested ways that may encourage them to use IM. Figure 1 illustrates the concerns and suggestions they had about using instant messaging to communicate with students.

Discussion

Previous findings we had collected from the survey and the results from the interviews showed that the most popular instant messaging platform mentioned by our students and faculty members was WhatsApp. The app was praised by students as being instant, allowing them to check if the other person has received and read the message, and letting users check if their contacts were online or not. Such advances in using technology and tools related to the Internet have the potential to have an impact on education, as communication is a vital part of a person's career and personal life. When dental schools are not aware of the way students are using new apps and Internet tools, the gap between students and faculty members will become larger and may impact the delivery of educational material. As commercial social networking sites develop more user-friendly apps, students are quickly adopting these on their mobile devices instead of using their dental school emailing platform.

Research in the past has stressed that knowing how much a student is involved in creating a learning environment¹⁹ and involving the students as primary stakeholders²⁰ will help faculty understand how the students prefer to learn. The results of our study show that students are actually taking control of their learning by introducing their personal preferred ways of communicating with peers and wanting the same communication with faculty members. It is important

Table 2. Demographics of faculty members interviewed

Respondent	Gender	Age
Faculty member 1	Female	60
Faculty member 2	Male	34
Faculty member 3	Male	51
Faculty member 4	Male	31
Faculty member 5	Male	35
Faculty member 6	Female	30

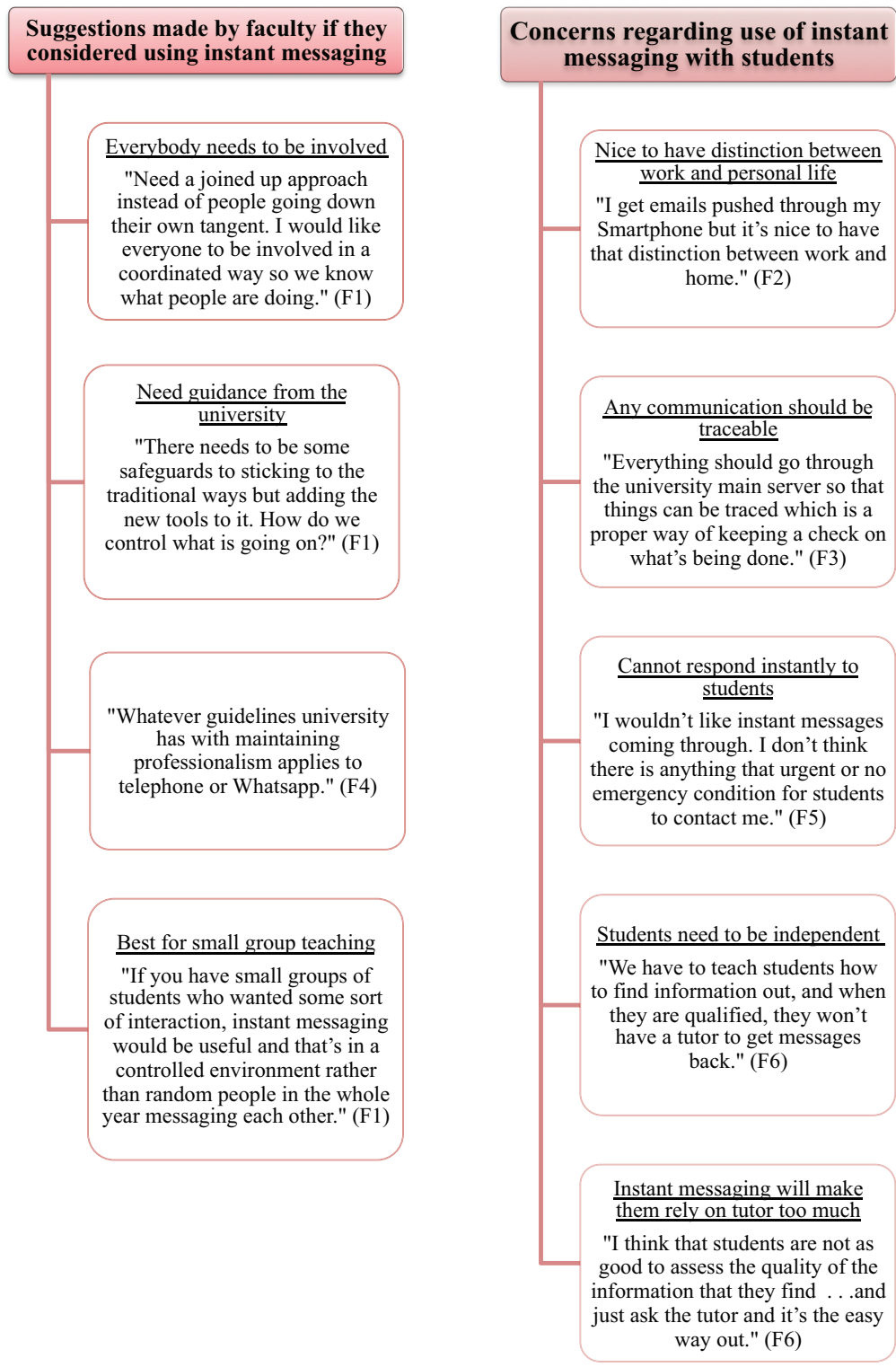


Figure 1. Faculty members' opinions/concerns regarding use of instant messaging as communication

to acknowledge that the students who took part in this study may not represent the opinions and attitudes of all students.

Although the majority of comments made by the students were positive about using IM apps for dental studies and communication, there were some negative feelings towards it. With regards to communicating with faculty members, students understood that it may be too personal for faculty members to have constant connection with students, and one faculty member mentioned that he would like to have a distinction between his personal and professional life. Doering et al. found that faculty members felt extremely uncomfortable with having a social rather than academic conversation with students on instant messaging platforms.²¹ One student in our interviews mentioned that it could be a distraction to her learning when chatting all the time and being connected all the time. Another student felt that pulling out a phone in class and clinic could look very unprofessional. Nicholson found that some students did not feel that IM would work as a learning tool but the concerns were different.²² Similarly, one student in our study commented, "It's actually the wrong technology to help facilitate learning, due to its inherent one-to-one nature." Another student felt that it was better valued as a social tool and a "fun waste of time." Students have both personal concerns and negative feelings towards IM as a learning and communication tool. Our results showed that students were willing to use IM apps more for group work and communicating with each other but were concerned about the opinions of dental faculty members towards communicating on similar platforms.

One faculty member in our interviews stated that emails and WhatsApp messages were the same to him and that he had no apprehensions about students messaging him through instant messaging. Another faculty member suggested that instant IM should be used with small group teaching classes and would be useful in a controlled environment rather than random people sending messages to each other. This idea is similar to finding in another study that advanced technology works well for small group teaching to facilitate increased contact between students and faculty members.²³ Other research reported that students who communicate with faculty members via IM have a personal connection with them and faculty members could get to know students individually in response and give tailored advice and tutoring.²⁴

Whilst using IM apps or sites, there is an option to create groups, which facilitates work discussion

and the option to share dental study-related work. One student in our interviews explained that, if there is a question, someone in her group would always be online and free to answer questions or chat in general about the work. Similar results were found by Lewis and Fabos as students in their study favored this sort of communication above the rest because they found it exciting to know when someone was online or not.²⁵ If they were not online, they would be back at some point as they would put their status up as "away." Such activities taking place, when students go home or even at university, need to be acknowledged by academic staff, so they can understand the impact of upcoming and new tools used for learning through communication.²⁶

Exchanging emails was the only way the students in our study reported communicating with faculty members when not meeting them face-to-face. However, faculty members explained that students were slow in replying to their emails and this was frustrating at times. Similarly, some of the reasons why students said emailing was not adequate were that it was too slow in getting a response from the faculty members, they could not find out if the faculty members had received and read their messages, it was not instant, and it was not possible to check if the faculty member was online at the time that they sent their message. Although some faculty members were not as resistant towards IM, they had concerns regarding the use of IM with students. Others explained that IM may not be traceable by the university, and this was a concern. Faculty members said that it was important to ensure that any issues related to students were addressed by the university.

Another faculty member argued that he would not like instant messages coming to him that were not urgent. He explained that any messages or questions could be solved the following day and that students did not need an instant platform to message faculty members. Similarly, Jones et al. and Jeong found that this method of communication may not be as favored by faculty and may require more time commitment.^{27,28} This could relate to the "Creepy Treehouse effect." Creepy Treehouse is a term used to describe technology/tools that learners are already using in their private lives being used by institutions as innovative ways to communicate. The Creepy Treehouse effect explains the repulse some users may feel when asked to participate in using intuitively controlled tools.²⁹

One faculty member emphasized that if students were provided with IM platforms, they would

not try to assess information and would feel that it was normal to message the faculty anywhere at any time. Yeboah and Ewur found that students who used WhatsApp in class experienced detrimental effects on their education.³⁰ These negative effects included taking up too much study time, not balancing academic preparations and online activities appropriately, and lack of concentration overall. However, Amry found that students who used WhatsApp seemed to have better problem-solving skills and could sometimes overcome learning difficulties through its use.³¹

Dental students and professionals have a duty to follow guidelines and protect patient confidentiality. The use of IM tools and other social media may have potential drawbacks related to the transmission of patient data. As IM tools are not yet secured by institutions, students could potentially breach patient confidentiality and privacy when discussing patients.³² The results show that there may be negative effects on students and faculty members when using IM as well as positive academic enhancements. Future research needs to concentrate on the use of IM in different settings.

Conclusion

The findings of this small study indicated an elevated level of contentment with IM use in this dental school compared to previous studies. IM was used as a communication tool by the students interviewed and also as a platform for group work. The students wished to make such tools a more permanent part of their learning but only with the approval of faculty members. Faculty members interviewed were reluctant about taking up such tools when communicating with students and would use them only if there was a controlled and monitored platform in place. Dental schools should be aware of such perspectives when they look to adapt their learning practices to IM technology.

REFERENCES

1. Junco R, Cotton S. Perceived academic effects of instant messaging use. *Comput Educ* 2011;56:370-8.
2. Papadopoulos L, Pentzou AE, Louloudiadis K, et al. Metadata correction: design and evaluation of a simulation for pediatric dentistry in virtual worlds. *J Med Internet Res* 2013;15:e268.
3. Walmsley AD, White DA, Eynon R, et al. The use of the Internet within dental education. *Eur J Dent Educ* 2003;7:27-33.
4. Straub-Morarend CL, Marshall TA, Holmes DC, et al. Informational resources utilized in clinical decision making: common practices among dentists. *J Dent Educ* 2011;75(4):441-52.
5. Marya CM, Marya KM, Dahiya V, et al. Internet usage among dental students in north India. *JPMA* 2013;63:628-9.
6. De Bakker G, Sloep P, Jochems W. Students and instant messaging: a survey of current use and demands for higher education. *Res Learn Technol* 2007;15:143-53.
7. Moorhead SA, Hazlett DE, Harrison L, et al. A new dimension of health care: systematic review of the uses, benefits, and limitations of social media for health communication. *J Med Internet Res* 2013;15(4).
8. Khatoun B, Hill KB, Walmsley AD. Dental students' uptake of mobile technologies. *Br Dent J* 2014;216(12):669-73.
9. Russo TJ, Fallon M, Zhang J, et al. Today's university students and their need to connect. *Brock Educ* 2014;23(2).
10. Morgan C, Cotton SR. The relationship between Internet activities and depressive symptoms in a sample of college freshmen. *Cyberpsychol Behav* 2014;6:133-42.
11. Ellison E, Nicole B, Steinfield C, et al. The benefits of Facebook "friends": social capital and college students' use of online social network sites. *J Comput Mediat Commun* 2007;11:43-68.
12. Nadkarni A, Hofmann SG. Why do people use Facebook? *Person Individ Differ* 2012;52(3):249.
13. WhatsApp: home. 2015. At: www.whatsapp.com/. Accessed 20 May 2015.
14. Kubey K, Robert W, Michael J, et al. Internet use and collegiate academic performance decrements: early findings. *J Commun* 2001;51(2):366-82.
15. Bowman LL. Can students really multitask? An experimental study of instant messaging while reading. *Comput Educ* 2010;54(4):927-31.
16. Junco R, Greg H, Eric L. The effect of Twitter on college student engagement and grades. *J Comput Assist Learn* 2011;27(2):119-32.
17. Lauricella S, Kay R. Exploring the use of text and instant messaging in higher education classrooms. *Res Learn Technol* 2013. At: www.researchinlearningtechnology.net/index.php/rlt/article/view/19061. Accessed 20 May 2015.
18. Cifuentes OE, Lents NH. Increasing student-teacher interactions at an urban commuter campus through instant messaging and online office hours. *Electr J Sci Educ* 2010;14(1).
19. Ramsden P. *Learning to teach in higher education*. London: Routledge, 2003.
20. Malti W. Reflection of using smart mobile devices to support teaching and learning in higher education. *Asian J Educ E-Learn* 2013;01:230-9.
21. Doering A, Lewis C, Veletsianos G, et al. Preservice teachers' perceptions of instant messaging in two educational contexts. *J Comput Teacher Educ* 2008;25(1):5-12.
22. Nicholson S. Socialization in the "virtual hallway": instant messaging in the asynchronous Web-based distance education classroom. *Internet Higher Educ* 2002;5:363-72.
23. Hillenburg KL. E-learning and the future of dental education: opinions of administrators and information technology specialists. *Eur J Dent Educ* 2006;10(3):169-77.

24. Hrastinski S, Edman A, Andersson F, et al. Informal math coaching by instant messaging: two case studies of how university students coach K-12 students. *Inter Learn Envir* 2014;22(1):84-96.
25. Lewis C, Fabos B. Instant messaging, literacies, and social identities. *Read Res Q* 2005;40:470-501.
26. Fry H, Ketteridge S, Marshall S. *Handbook for teaching and learning in higher education: enhancing academic practices*. 3rd ed. London: Routledge, 2009.
27. Jones G, Edwards G, Reid A. How can mobile text messaging communication support and enhance a first-year undergraduate learning environment? *ALT J Res Learn Technol* 2009;17(3):201-18.
28. Jeong W. Instant messaging in on-site and online classes in higher education. *Educause Q* 2007;1:30-6.
29. Jared S. Defining “Creepy Treehouse.” *Flexknowlogy* 2008. At: <https://web.archive.org/web/20120423122701/http://flexknowlogy.learningfield.org/2008/04/09/defining-creepy-tree-house>. Accessed 4 Apr. 2015.
30. Yeboah J, Ewur GD. The impact of WhatsApp messenger usage on student performance in tertiary institutions in Ghana. *J Educ Pract* 2014;5(6):157-64.
31. Amry AB. The impact of WhatsApp mobile social learning on the achievement and attitudes of female students compared with face to face learning in the classroom. *ESJ* 2014. At: <http://eujournal.org/index.php/esj/article/viewFile/3909/3700>. Accessed 26 Dec. 2014.
32. Khatoun B, Hill KB, Walmsley AD. The dos and don'ts of social networking in dentistry. *Dent Update* 2014;41(8):690-6.