

## TWELVE TIPS

# Twelve tips for using Twitter as a learning tool in medical education

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## Abstract

**Background:** Twitter is an online social networking service, accessible from any Internet-capable device. While other social networking sites are online confessionals or portfolios of personal current events, Twitter is designed and used as a vehicle to converse and share ideas. For this reason, we believe that Twitter may be the most likely candidate for integrating social networking with medical education.

**Aims:** Using current research in medical education, motivation and the use of social media in higher education, we aim to show the ways Twitter may be used as a learning tool in medical education.

**Method:** A literature search of several databases, online sources and blogs was carried out examining the use of Twitter in higher education.

**Results:** We created 12 tips for using Twitter as a learning tool and organized them into: the mechanics of using Twitter, suggestions and evidence for incorporating Twitter into many medical education contexts, and promoting research into the use of Twitter in medical education.

**Conclusion:** Twitter is a relatively new social medium, and its use in higher education is in its infancy. With further research and thoughtful application of media literacy, Twitter is likely to become a useful adjunct for more personalized teaching and learning in medical education.

The qualities that make Twitter seem inane and half-baked are what makes it so powerful – **Jonathan Zittrain, Harvard Law Professor.**

## Background

Twitter is an online social networking service accessible from any Internet-capable device. It allows people to connect virtually through microblogging – exchanging ‘nuggets’ of information in 140 characters or less (Skiba 2008). Since its introduction in 2006, the use of Twitter has increased exponentially. There are now more than 200 million Twitter accounts worldwide, and 100 million active users who Tweet at least once per month. About half of those active users log in daily and adults are the predominant demographic using this technology (Twitter blog 2011). While Facebook, LinkedIn and other personal profile sites are online confessionals or portfolios of personal current events, Twitter is designed and used as a vehicle to have a conversation and share ideas. For this reason, Twitter may be the most likely candidate for integrating social networking and medical education.

Posting in 140 characters or less is easy, informal, and with a few simple searches, it is possible to find others who share similar interests and join their cyber conversation (Cain Miller 2009). Twitter allows people to share information instead of just receiving it (Bristol 2010). It is used not only to share

reflections about daily life but also as a ‘pointing device’ to direct people to longer articles and videos.

It’s just as easy to use Twitter to spread the word about a brilliant 10,000-word *New Yorker* article as it is to spread the word about your Lucky Charms habit. Put those three elements together – social networks, live searching and link-sharing – and you have a cocktail that poses what may amount to the most interesting alternative to Google’s near monopoly in searching. (Johnson 2009)

We now get ‘as much information from each other as we do from the media’ in an exponential fashion (Hawn 2009; Poole 2010). This exchange of information has potential implications in all spheres from health care to higher education to medical education.

In 2009, Baumann listed 140 potential uses for Twitter in health care. Although the author acknowledged some of the challenges including infringing on patient privacy and litigation issues, he also listed many positive applications. These included epidemiological surveys, disaster alerts, adverse event reporting, reporting of critical lab values, booking patient’s appointments and appointment reminders and large scale tracking of antibiotic resistant organisms (Baumann 2009).

In addition to the various potential uses of Twitter for health care listed by the author, 21 of the potential applications related to medical education. Many of these applications

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reflect other authors' discussions about the use of Twitter in higher education, such as Szapkiw and Szapkiw (2011):

Social media applications provide educators with the opportunity to foster engagement and interaction in their higher education classrooms. Specifically, Twitter helps engage learners using a media application in which they are interested. It enables educators to curb the traditionalist comprehension based model and encourages critical thinking, synthesis, and evaluation throughout the learning process. Twitter allows learners and educators to interact via "Tweets" via Smartphones, laptops, or any device with Internet access.

Taking advantage of using a modality that is already used by many students will likely benefit medical education.

In this article, we draw upon current research in medical education, motivation and the use of social media in higher education to present 12 tips for incorporating Twitter into medical education. The tips are written as microblogs and organized as follows: the first two tips address the mechanics of using Twitter; the following nine tips present suggestions and evidence for incorporating Twitter into a variety of aspects of applied medical education contexts and the final tip presents an argument for pushing the use of Twitter in medical education beyond information exchange and into the realm of research.

## Methods

A search of the literature was conducted using combinations of the terms Twitter, education, medical education, health care and microblogging. Several databases were searched: PubMed, which yielded 20 articles, of which 12 were deemed appropriate. A Google Scholar search yielded 80 articles, of which 16 were deemed appropriate. A Google Search revealed seven articles and an ERIC search revealed two articles related to medical education and Twitter. The reference sections for all articles were reviewed, and additional articles sought. No new articles were found through this method. Finally, several blogs and online sources were found through references from other articles.

The 12 tips for using Twitter in medical education are as follows.

### Tip 1

Get started (12 characters)

It is important for the medical educator to learn about this technology. The first step is to set up a personal account at [www.Twitter.com](http://www.Twitter.com) using any name (up to 15 letters long). A Twitter literate mentor (Twentor) is a useful reference.

### Tip 2

Learn the language (19 characters)

Tweets are 140 character messages sent via Twitter. These messages are 140 characters because there is a 160 character

limit for SMS (short message service) on cell phones. (The extra 20 characters are used for the username.)

For example, the previous three sentences could be reduced to a Tweet as follows:

**Tweet = 140 character msg on Twtr.Msg  
= 140 characters bc of 160 character limit 4 cell  
phone SMS (Short msg Service) (+20 characters  
4 username)**

Twit, Tweeples and Tweepers are Twitter users. The Twittersphere is the entire community of Twitter users. A Twitterstream is the chronological list (similar to an e-mail inbox) of Tweets from Twitter users that you 'follow'. Every time a Tweeples that you follow Tweets something, it will appear in your Twitterstream. Similarly, any of your Tweets will appear in the Twitterstream of people following you. You may block people from following you or unfollow them (also known as a Twitectomy). You can also 'reTweet' and copy a Tweet from someone else so that all of your followers can see it. ReTweeting is an excellent way to get started in Twitter by identifying public Tweets in your area of interest and rebroadcasting them to your followers. The more you Tweet, the more Twitter users will find you and follow you. A hashtag (#) is used to highlight a search term in a Tweet. For example, if you search #meded or include this in your message, it will be aggregated with other Tweets on the same topic (Ferguson 2010).

### Tip 3

Set up a Twitter account 4 a specific class or group, set ground rules for use and promote guidelines for professional behaviour (127 characters)

It is advisable that medical educators set up specific Twitter accounts for each of their classes. To protect class interactions, check the account settings to ensure the profile is set at 'Protect My Tweets' (Szapkiw & Szapkiw 2011).

Medical educators who decide to use Twitter to facilitate discussions or disseminate information MUST create ground rules and have disclaimers reminding users and followers that they accept full responsibility for their Tweets. Frequent updates for all users on the implications of social media and privacy are imperative (Bristol 2010). It is critical that both educators and students, who may not recognize all of the possible pitfalls, are made aware of the legal and ethical issues involved with using this medium (Guseh et al. 2009). Guidelines for the correct and safe use of social networking in medicine must be adhered to (Rippen and Risk 2000; Landman et al. 2010).

While Twitter offers 'instant publication with few restrictions', maintaining professionalism is very important. All public Tweets are digitally archived by the Library of Congress, so every public Tweet is recorded. While the Library of Congress repository does not contain protected or private Tweets, students and medical educators must be aware that with reTweeting, users can rebroadcast another's Tweet with a few clicks and send the message out in an exponential fashion to

hundreds of millions of users worldwide and make private Tweets public (Ferguson 2010).

Further to the issue of professionalism, some experts suggest having a personal Twitter homepage and a professional Twitter homepage to reduce the amount of personal information on professional sites; or opening a separate Twitter account for each class (Gordon 2009). Others have created user formulas:

70% of Twitter time should be spent sharing other voices, opinions and tools; 20% of Tweets should be directly responding, connecting, collaborating, and co-creating with Twitter colleagues; and 10% is chit-chatting trivial details about your life as a human being. (Maiers 2008)

When physicians who used Twitter frequently had their Tweets studied, 3% (104) of the Tweets were unprofessional. Of those unprofessional Tweets, 33 (0.7%) violated patient privacy, 33 (0.7%) contained profanity, 0.3% (14) contained sexually explicit material, 0.1% (4) had discriminatory statements. One per cent (55) were classified as 'other' and included issues with conflict of interest and therapies that went against existing guidelines or existing medical knowledge (Chretien et al. 2011).

## Tip 4

Display live Twitter chat during lectures or academic half-days (64 characters)

Twitter has been examined as a tool to enhance participation in lecture-based settings. As the classroom discussion unfolds, students are encouraged to post their questions via Twitter and a live stream of Tweets is posted onscreen. This allows students to ask questions that relate to their own experiences, which may enhance their learning processes (Dewey 1938). It alters classroom dynamics, giving students more control, and encourages students to pay close attention to the discussion (Wankel 2009). While this excites some, others worry that Tweets may get out of hand, and some professors have opted to introduce this method just part of a session. Furthermore, having a whole session with questioning Tweets may be distracting, and some take intermittent breaks during the session to address several questions at once (Young 2010).

Organizers at the Medicine 2.0 conference used a slightly different approach with live Tweeting during a lecture. They allotted speakers 50 minutes, but asked them to finish their talk in 20 minutes. At the end of 20 minutes, the Tweets on the screen were reviewed and discussed. This method reduces speaker distraction and allows for input from shy members of the audience, and also from those not able to attend the conference (Chu et al. 2010).

Live Twitter Chat may also be a valuable and cost-effective way to include students who are unable to attend sessions in person. In distributed learning environments, where tele- and video-conferencing is used, Tweeting questions during presentation of material allows for the questions to be collected without interrupting the flow of the lecture or presentation.

Further, Live Twitter Chat avoids the problem of losing possible questions as a lecture moves from topic to topic.

## Tip 5

Use Twitter as a platform to convey credible information sources to students (77 characters)

An online survey of health care students revealed that most prefer to use online information sources (Giordano 2011). However, much of the information on the Internet is unverified and it may be impossible to authenticate sources (Thames 2009; Chretien et al. 2011). At the present time, students 'get as much information from each other as [they] do from the media' (Poole 2010). Therefore, medical educators must be up to date on available sources and methods to provide online information to students such as links on a Twitter homepage or useful Tweets about medical education.

An analysis of 5156 Tweets from physicians with more than 500 followers showed that: 49% (2543) were medically related, 21% (1082) were personal communications, 14% (703) were reTweets and 58% (2965) had links. Thirty-one (1%) were related to medical education, 73 (1%) recommended a medical product or service and 634 (12%) were self-promotional (Chretien et al. 2011).

Many students and residents are already accustomed to checking Tweets, texts and e-mails regularly. Using Twitter to post links to credible sources will likely increase students' use of those resources, as a simple click will take them to the information. With Tweet notifications via SMS (texts), and newer applications that support push notifications for Tweets, users can receive instant notifications when those they follow have Tweeted (Hu Kim 2012). This kind of 'push' approach to encouraging the use of credible resources capitalizes on the existing predilection of students and residents to stay on top of information in an easily retrievable format.

## Tip 6

Use Twitter to create a 'real life' context for students (57 characters)

Links to current media stories that relate to course content create 'real life' applications that may allow students to contextualize course information (Aujla 2009). Making didactic content meaningful by giving it a current and immediate context has a positive influence on intrinsic motivation (Hidi 2001). Meaningful tasks increase student motivation by increasing the utility value of a task (Eccles et al. 1998), and enhance the chances that students will adopt a learning goal orientation and engage in deeper learning strategies (Meece et al. 1988).

One of the first descriptions about the use of Twitter in health care education involved a medical trainee Tweeting in real time his observations of a robotically assisted laparoscopic surgery. When other members of the health care team were asked their opinions about Tweeting the surgery, most agreed it caused little harm. However, the surgeon performing the procedure stated that those wanting to learn the procedure

would have more success watching it (Butterfield 2009). Others have Tweeted about surgical observations in real time as a method to increase referrals and to advertise the procedure to the general public (Dolan 2009).

## Tip 7

Start a Twibe (Twitter group) (30 characters)

Students learn in both formal and informal settings (Greenhow et al. 2009). Informal learning is course related, but revolves more around students' self directed and independent learning activities (including peer-to-peer interactions; Jamieson 2009). Twibes can give students the opportunity to communicate outside of class and create a team atmosphere:

in a way that doesn't leave them buried in emails and lost in seemingly endless conversation threads... Every member of the class can communicate, follow each other, subscribe to each other's blogs... and do this in a way that is easy, efficient, and that doesn't make [them] afraid of [their] email. (Lamb 2011)

By using Twitter, all students can see and participate in the discussion (Educause Learning Initiative 2011). Twibes offer a unique atmosphere for interaction that may move beyond a typical discussion on e-mail or discussion boards.

Twitter does not always allow for a clear back and forth discussion between parties, it is more like a party where the noise from all of the discussions is heard, and people are able to move from group to group as their interest is piqued. (Eleni Stroulia, University of Alberta Professor of Computing Science, Personal Communication 2012)

Twitter offers an 'egalitarian, efficient way to spread info relevant to pedagogical goals, as well as the ability to create a sense of social learning and engagement within a community' (George & Dellasega 2011).

In a study examining Twitter's use in a medical humanities course, students were invited to Tweet with the course instructor about their clinical experiences. Analysis of student feedback showed that Twitter allowed novel learning to occur, and increased connections between students and instructors through real-time dialogue. It also increased student engagement with the course (George & Dellasega 2011). Another study involving an urban planning course compared students' knowledge generation in traditional discussions and paper diaries with knowledge generation in a class-based Twibe (Kassens-Noor 2012). They found that Twitter was better suited to creating and sharing large amounts of information, ensured more consistent input and engagement (due to date and time stamps on Tweets), and that Twitter fostered a much higher percentage of team-created solutions when compared with discussions and paper diaries.

Twibes can provide a contextualized environment for students to discuss issues that are relevant yet peripheral to the topic at hand. Issues of professionalism, law and ethics that arise can be discussed and debated in this way without side-tracking the presentation of the core material in lecture.

Lecturers can even present related case studies to start a debate about the peripheral topics that relate to the topics in lecture. This may create a richer exploration of the topic than may otherwise be possible in a traditional lecture.

## Tip 8

Use Twitter for real-time feedback (34 characters)

Twitter has been used to provide formative feedback to instructors in a course on research internship. Each student created a Twitter account with a non-personalized nickname. The students could read the professor's Tweets and the professor could read the students' Tweets, but the students could not read each other's Tweets. For the formative feedback portion, the students were asked open and closed questions after each class via Twitter. For the summative portion, each student was asked open and closed questions about the entire course via Twitter. Although similar questions were asked, the formative evaluations yielded different information than the summative evaluations and Twitter was deemed to be a potentially useful tool for evaluations (Stieger & Burger 2010).

This format for course evaluations may have advantages over traditional methods. Students may feel more anonymity without feeling disconnected from the feedback they are giving. The formative feedback to the instructor is based on what is actually happening in each class, and the open-ended structure potentially allows students to give more information than in a traditional evaluation. As well, by giving formative feedback after each session, the instructor has an opportunity to act on feedback, rather than being given feedback after a course is over and having no opportunity to emphasize the good aspects of the instruction while addressing and improving upon the areas that required revision. The disadvantage to this form of feedback is that it may be overwhelming in large classes. In this type of setting, it may be advantageous to ask small groups of students to give feedback.

## Tip 9

Encourage students to be creative and communicate with brevity and depth (72 characters)

Use of Twitter may lead to succinct, careful communications. This is an important tool for future physicians who need to learn how to communicate with brevity and depth (George & Dellasega 2011). According to the Educause Learning Initiative, 'Twitter can be a viable platform for metacognition, forcing users to be brief and to the point – an important skill in thinking clearly and communicating'. One way to develop the skills of being concise and clear is to ask students to contribute to a story 140 characters at a time (Skiba 2008). Writing a story this way is a 'Twtitory', a concept combining Tweets and stories created by Reilly (2007).

Twtitory and other exercises that force students to communicate in brief, clear and concise formats can help develop student focus on the essentials of patient care. These skills

are valuable in clinical practice, and apply directly to real-life contexts in health care where important information must be shared accurately, such as in patient handovers and transfers.

## Tip 10

Use Twitter to prompt self and group reflection (48 characters)

One of the manifestations of the cognitivist learning theory is the development of reflective thinking (Brookfield 1995). Reflection allows the learner to relate new knowledge to what is already known. Twitter can offer a unique environment for reflection where students have the opportunity to both self reflect and the 'opportunity to be a part of someone else's process by reading, commenting, discussing or simply enhancing it' (Ebner et al. 2010).

A pilot study in a medical humanities course had a professor prompting students on Twitter with questions. One question: 'Bidding farewell to medical school is...'. The comments were collated on a blog, and the students worked together to create a letter. This provided them with a rich dialogue on closure (George & Dellasega 2011).

Setting reflection in such a context may be more appetizing to students than traditional methods of eliciting reflection. Many students are already using Twitter to share their views on the world and the events they experience or observe. Instructors can capitalize on this current use and prompt students to reflect on elements of clinical experiences. It is a natural progression to scaffold and support an existing behaviour to elicit reflections about patient encounters and other elements of the medical education experience.

## Tip 11

Use Twitter for informal quizzes and polls (42 characters)

Twitter polling applications allow educators to offer a different option for informal quizzing and polls when compared to a show of hands. Questions can be asked out loud or projected on a screen, and students can Tweet their answers. This allows for instant feedback about group understanding and the chance for immediate discussions and clarifications. Because Tweets are anonymous, more students are likely to submit answers (Szapkiw & Szapkiw 2011).

Twitter quizzes and polls may have an advantage over using existing education technology such as clickers. The majority of the students in any educational setting will have smart phones with them. This removes the 'housekeeping' aspect of using clickers: the need to be in a clicker-enabled classroom, handing out clickers, ensuring that the correct code is entered. Students simply pull out their existing personal devices and participate. Additionally, Twitter allows students to provide commentary, while clickers do not.

## Tip 12

Study Twitter in medical education (34 characters)

There are many opinions and ideas about Twitter and very few studies examining appropriate ways and times to use it in any type of university level education (including medical education). While it is obvious that Twitter may increase student engagement in large group learning situations, it is not clear if the use of this technology will lead to deeper learning. We do not feel a study comparing the use of Twitter to no intervention is useful. We suggest instead, comparing groups using different Twitter interventions we have described in this article. Quantitative studies comparing pre- and post-knowledge tests and qualitative studies consisting of interviews with students from the different groups would elucidate appropriate ways and times of integrating this technology into medical education.

More sophisticated approaches to studying Twitter in medical education are possible, and should also be explored. As mentioned in Tip 3, all public Tweets are digitally archived by the Library of Congress. This means that an enormous database is available to researchers who wish to carry out secondary data analysis of existing medical education-related Tweets. Multiple research questions could be examined using this approach: from simple descriptive studies of the kinds of Tweets sent by instructors to content analysis studies of the themes that recur in medical education contexts across the globe.

## Conclusion

While there are many online tools for teaching and learning, Twitter offers the unique capability of allowing the user to peruse brief nuggets of information (provided by their own social network) and focus on topics of personal interest. In this way, Twitter offers a platform that can truly be tailored by the individual learner. Furthermore, use of Twitter is not limited to those who have access to a computer – users can communicate from any device with Internet capabilities. This is the most powerful aspect of microblog platforms – they can be written or read 'via web interfaces, mobile phones with special free applications, short message services (SMS) or even instant messaging tools (IM). Participation from anywhere in the world made the famous expression A3 (anytime, anywhere, anybody) increasingly true' (Ebner et al. 2010).

Many students are already familiar with social networking and the use of Twitter, and it has been shown through anecdotal descriptions and pilot studies that incorporating Twitter into traditional learning environments may promote student engagement. Twitter allows students to learn in informal settings, have more control over their learning and it can create communities of inquiry.

Twitter may allow students, who may not otherwise participate, an avenue to share ideas and communicate with peers and teachers. Twitter also allows for immediate feedback and documentation of learning activities over time. Finally, the intent of Twitter is to communicate and discuss topics with others – unlike other social media sites like Facebook, which are intended and used for talking about oneself.

While there are many advantages to using Twitter, there are also some drawbacks. First of all, Twitter does not allow for communicating long, complex thoughts. Second, people may not comprehend all of the ethical and legal implications of using social media in medical education. Using this medium must involve educating both educators and students around privacy issues and media competencies (Rheingold 2010). Rheingold discusses five media competencies related to attention, participation, collaboration, network awareness and critical consumption. *Attention*: the online world provides many distractions and Twitter users in medical education must become more deliberate about and aware of how they direct their attention. *Participation*: participation must involve a modification of one's sense of self – moving from a passive consumer of information to an actively engaged participant and productive information contributor. *Collaboration* – when using Twitter in medical education it is imperative to act with others in mind and be aware of the implications of participating within a larger setting. *Network awareness* – humans live in networked societies. When examining technology's contribution to these networks using Reed's Law, there are different values: telephone conversations, for the most part, offer linear connections where there is a one to one exchange; e-mail allows for squared connections where even more people may connect; newsgroups and virtual communities on media such as Twitter allows for exponential connections (Reed 2001). Therefore, it is imperative to be aware of the extent of information distribution in the public domain. *Critical consumption* – An enormous amount of information exchanged on Twitter, and it is up to the consumer to determine if the data is trustworthy and if it is worth reading.

[Twitter] is not a queue; it's a flow. An email inbox is a queue because we have to deal with each message one way or another, even if we simply delete them. [On Twitter there is no way to check everything] so we have to learn to sample the flow, and doing so involves knowing how to focus attention. (Rheingold 2010)

Twitter is a relatively new social medium. As we have shown, medical educators have just started to explore its use in higher education. With further research and the thoughtful application of media literacy, Twitter may become a useful adjunct for more personalized teaching and learning in medical education.

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