Evaluating the Use of Twitter as a Tool to Increase Engagement in Medical Education

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ABSTRACT

Background: Social media is regularly used by undergraduate students. Twitter has a constant feed to the most current research, news and opinions of experts as well as organisations. Limited evidence exists that examines how to use social media platforms, such as Twitter, effectively in medical education. Furthermore, there is limited evidence to inform educators regarding social media's potential to increase student interaction and engagement. Aim: To evaluate whether social media, in particular Twitter, can be successfully used as a pedagogical tool in an assessment to increase student engagement with staff, peers and course content. Methods: First year biomedical science students at Monash University completing a core public health unit were recruited into the study. Twitter-related activities were incorporated into the semester long unit and aligned with both formative and summative assessments. Students completed a structured questionnaire detailing previous use of social media and attitudes towards its use in education post engagement in the Twitter-specific activities. Likert scale responses compared those who participated in the Twitter activities with those who did not using students' t-test. Results: A total of 236 (79.4%) of invited students participated in the study. Among 90% of students who reported previous use of social media, 87.2% reported using Facebook, while only 13.1% reported previous use of Twitter. Social media was accessed most commonly through a mobile device (49.1%). Students actively engaging in Twitter activities had significantly higher end-of-semester grades compared with those who did not [Mean Difference (MD) = 3.98, 95% CI 0.40, 7.55]. Students perceived that the use of Twitter enabled greater accessibility to staff, was a unique method of promoting public health, and facilitated collaboration with peers. Discussion: Use of social media as an additional, or alternate, teaching intervention is positively supported by students. Specific use of micro-blogs such as Twitter can promote greater student-staff engagement by developing an ongoing academic conversation.

Keywords: Social media, assessment, peer support, Twitter, student engagement

Background

Social media technology (SMT) has changed the way that people communicate with each other on a daily basis.[1] It is a rapidly growing area incorporating web-based and mobile applications that allow users, both individuals and groups, to engage in a digital environment in order to communicate, interact and share content.[2] Today the two most popular SMTs are Facebook and Twitter boasting 968 million and 320 million users, respectively.[2,3] In Australia, internet usage is universal with 68% of users also using social media.[4] Of this it is estimated that 93% of social media users are on Facebook and 17% are on Twitter.[4] Both SMTs operate very differently and provide users with an individualised experience of online participatory culture, promoting not only the consumption of media but also what was known in the dot-com era as ‘prosumption’. In this way users are not merely consumers but also producers of content within the...
digital social environment. Facebook provides users with a profile where commonalities are shared and interaction is within a selected community. Twitter, by contrast, allows users to send short messages known as ‘Tweets’ — essentially a form of microblogging with a limit of 144 characters — to express ideas and links to an open ended group. Facebook and Twitter are not limited to original user content, but also allow for social networking, video sharing or status updates. This makes them part of the digital landscape that allows for global exchange of dialogue and a new way to provide and share new information.\(^1\)

The efficacy of using SMT as an educational tool remains highly contested in the higher education sector. To date, universities have preferred to use this format to engage with their students in real time rather than to achieve any assessable academic activities based on learning outcomes. This communication has either been of a social nature, for example promoting class reunions and live chat sessions, or specific to educational content, including communication about timetabling and activities about seminars, lectures, and online courses. Nevertheless, most e-learning activities have traditionally used academic content management systems, such as Blackboard or Moodle, to provide students with academic materials, staff communication and information. These academic content management systems achieve their goals as content repositories and communication hubs, but are limited to the enrolled cohort of students and staff of the university and particular unit. A disadvantage of this mode is that this does not allow for external interaction with employers or professionals or even other students and staff employed by the university.

Integration of social media, such as Twitter, in curricula is a slow but growing trend. A driver of its integration in curricula is the possibility to promote ongoing public dialogue. The advantages of social media integration are synonymous with those of e-learning and include overcoming physical barriers, the flexibility of autonomous learning and the encouragement of interactivity. However, concerns remain about privacy, online professionalism and student safety, maintaining the class as a private space for free and open discussion, and the impact that a lack of an evidenced-based approach can have on the integrity of student learning outcomes.

Despite its popularity as a social media tool, there is limited evidence to inform educators as to whether Twitter can, or should, be used as an educational tool. Furthermore, no studies to our knowledge have explored what impact the use of a social media intervention, such as Twitter, has upon student performance or how students perceive its application as an academic tool in public health. Therefore, we aim to evaluate the effectiveness of our Twitter task as a tool to engage students with public health concepts and increase staff and peer interaction.

**Methods**

**Participants and setting**

First year biomedical science students completing a core public health unit were invited to voluntarily participate in this study. Bachelor of biomedical science students a three year undergraduate entry level degree. Graduates of this program can pursue various careers in health or research and it is also a pathway into the postgraduate medical degree program. Those students not wishing to engage on social media or obtain a Twitter account were given the alternate option to complete the same tasks in a discussion board via the unit’s standard content management system. Students participating in the study agreed to register for a Twitter account, if they did not already have one. Students were not required to use their names or any identifiers when creating their Twitter ‘handle.’

**Social media tasks**

Three social media educational interventions were implemented throughout the 12 week semester as part of weekly tutorial activities. There were three main tasks piloted as part of this curriculum:

1. **Task 1:** As an introduction students were asked to play a game accessed through the app, ‘Dumb Ways to Die.’ The game invites players to navigate Metro Trains in Melbourne, Victoria, Australia, to promote rail safety. The game invites players to navigate the dangerous activities engaged in by the various characters. The activities include crossing the train tracks and poking a stick at a grizzly bear. The aim of the game is to earn as many points as possible by avoiding ‘dying’ whilst completing the activities. At the conclusion of the game, students were required to Tweet their experience. This included their final score, the fate of their character, and their thoughts on the game.

2. **Task 2:** This task required students to identify a public health issue in their daily lives by posting a photo, image or link to a journal article of interest via Twitter. Students had to explain in a tutorial activity why they had chosen this image and its significance.

3. **Task 3:** Students had to post on a relevant public health issue in the media therefore exposing them to the wider public health conversation. Topics included, but were not limited to, recent outbreaks of measles, cancer and women’s health, and various health promotion strategies. Students were required to use the #SPHPM hashtag to interact with peers and staff. (Appendix 1: Student Example Tweets).

Prior to the commencement of the task students were introduced to e-professionalism concepts, and counselled on what constitutes proper and improper use of social media for the purposes of the assignment. Further, they signed a professional code of conduct agreement for the assessment and unit. All relevant social media
aspects were strictly observed by staff with no instances of unprofessionalism observed. Had there been any instance of suspected or reported misconduct students would have been referred to the existing university-wide policy and procedure for online behavior.

**Data analysis**

Students’ perceptions and attitudes toward social media as an educational tool were examined using an 18 item questionnaire. (Appendix 2: Questionnaire). Responses were coded in either a dichotomous format or on a five-point Likert scale with 1 being strongly disagree and 5 strongly agree. Student performance was assessed by grades obtained in the unit as a whole as a score out of 100, as well as their score on the Twitter task, which was worth two percent. Students’ attitudes were assessed within the questionnaire by self-report and compared to those who did not complete the task. All responses were descriptively analysed, with student performance and attitudes across previous social media users and non-users, and those that completed and did not complete the Twitter task, analysed using student’s t-tests. Ethics approval was obtained from the Monash University Human Research Ethics Committee.

**Results**

All 297 students enrolled in the public health unit from July-November 2013 completed the questionnaire as feedback for the unit. One hundred and thirty-one (44%) were male and 166 (56%) were female, all aged between 18-25 years. Of those enrolled, 236 (79.4%) completed all Twitter-related educational activities with an additional 13 students partially completing the task. The remaining 20% cited various reasons for abstaining, including forgetfulness, no perceived value in the assessment, and not wanting to set up an account.

Approximately 90% of students reported previous use of social media with the vast majority (87.2%) reporting using Facebook [Table 1]. Only 13.1% reported previous use of Twitter, with 107 (36%) students using multiple social media platforms, up to four, concurrently. The most common method of accessing social media reported was through a mobile device (49.1%).

The questionnaire identified that students’ self reported attitudes were positive towards the use of social media, in particular Twitter, in the learning environment. Overall, the students believed that the learning task using Twitter enabled greater accessibility to staff, was a unique method of promoting public health and facilitated collaboration with peers averaging 3.7, 3.9 and 3.1 on the Likert scale [Figure 1].

### Table 1: Use of Twitter in our cohort of 297 first year undergraduates

<table>
<thead>
<tr>
<th>Variable</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>166 (56)</td>
</tr>
<tr>
<td>Male</td>
<td>131 (44)</td>
</tr>
<tr>
<td>Prior use of social media</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>260 (87.5)</td>
</tr>
<tr>
<td>No</td>
<td>3 (1.0)</td>
</tr>
<tr>
<td>No response</td>
<td>34 (11.5)</td>
</tr>
<tr>
<td>Previous use of social media*</td>
<td></td>
</tr>
<tr>
<td>Facebook</td>
<td>259 (87.2)</td>
</tr>
<tr>
<td>Google +</td>
<td>13 (4.4)</td>
</tr>
<tr>
<td>Instagram</td>
<td>80 (26.9)</td>
</tr>
<tr>
<td>Tumbler</td>
<td>26 (8.8)</td>
</tr>
<tr>
<td>Twitter</td>
<td>39 (13.1)</td>
</tr>
<tr>
<td>Preferred mode of accessing and using social media</td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td>73 (24.5)</td>
</tr>
<tr>
<td>Mobile device</td>
<td>146 (49.2)</td>
</tr>
<tr>
<td>Both computer and mobile device</td>
<td>33 (11.1)</td>
</tr>
<tr>
<td>None/no response</td>
<td>45 (15.2)</td>
</tr>
<tr>
<td>Should social media be used in learning activities?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>222 (74.8)</td>
</tr>
<tr>
<td>No</td>
<td>47 (15.8)</td>
</tr>
<tr>
<td>No response</td>
<td>28 (9.4)</td>
</tr>
</tbody>
</table>

*Students may have listed more than one form of social media previously used

![Figure 1: Overall student response to Twitter-related assessment](image)

**Comparison between those who completed the Twitter-related task and those that did not**

In comparing the attitudes of those who completed the tasks to those that did not, it was identified that both groups agreed that the tasks provided greater access to staff and an increased awareness of public health in their daily lives [Figure 2]. However, there was a significant difference in attitudes between these groups in terms of peer collaboration [Mean Difference (MD) = 0.547, 95% Confidence Interval (CI) 0.21, 0.94] with those who completed the task expressing a lack of peer collaboration. This is in contrast to those who did not complete the task as they
found an increased collaboration amongst peers despite not partaking in the assessment which requires further exploration.

Comparison between previous Twitter-users and participants with no previous use

Students who were previous Twitter users reported a firmer belief that the tasks would provide greater accessibility to staff when compared to non Twitter users [MD = -0.36, 95% CI -0.65, 0.07]. However, no difference was observed in attitudes between previous Twitter users and non-users with respect to using Twitter as a method of promoting public health [MD = -0.16, 95% CI -0.46, 0.12], or facilitating collaboration with peers [MD = 0.25, 95% CI -0.60, 0.08] [Figure 3].

Twitter task and grades

Students who completed the Twitter-related learning activities, had significantly higher end-of-semester grades when compared to those students that did not complete the Twitter learning activity [MD = 3.98, 95% CI 0.40, 7.55]. There was no significant difference in end-of-semester grades when comparing students who had previously used social media with those that had not or reported no previous use [MD = 4.28, 95% CI -0.16, 8.59]. Also, no significant difference was observed when comparing whether students believed that using Twitter was appropriate for classroom learning and their end-of-semester grades [MD = 0.37, 95% CI -3.47, 4.21]. The quality of the assessment was consistent with the rubric provided and completed at a high standard. Only 4% of the students received partial marks for incomplete responses with 85% receiving full marks.

Discussion

Our findings show that the vast majority (90%) of our first year undergraduates are current users and actively engage with social media platforms, with Facebook being the most commonly used. Within this cohort, almost 80% of students completed the Twitter assessment task and had a positive attitude to social media use in the curriculum. Overall, students reported that the use of Twitter had the potential to promote greater student-teacher interaction, as well as engagement with public health interests.

In 2014, an Australian census of social media usage found that both males and females were avid social media users with 93% of Australians using Facebook and spending eight and half hours a week on the site.[4] Seventy percent used their Smartphones as their preferred method to access and engage with social media regularly. Our demographics and user characteristics are similar to those seen in the census. Our findings show that Facebook was the preferred social media technology, with access to it evenly split between Smartphones and laptops/desktop computers. This can most likely be attributed to convenience of use, personal preference to complete tasks on a computer, or the uncertainties related with learning how to use a new social media platform. Only 13.1% of our students had previously used Twitter, which was lower than the national average of 17%, and also meant that the Twitter task was the student’s first exposure to the platform.[4] Although, there is an expectation that ‘Generation-Y’ students are ‘digital natives’, our empirical evidence suggests that they are selective with respect to which social media platforms they engage with.[16] Therefore, if platforms such as Twitter are to be used as educational tools, students will require additional support and introductory materials to ensure effective and efficient uptake and use of it.[6] Not surprisingly, all of our students accessed the provided online ‘how to complete this Twitter task guide’ and the ‘Twitter basics’ manual.

With respect to the use of Twitter and improved student performance as measured by their final grade we found that
our results are in keeping with the previous literature.[7,10,11] Junco et al.'s study of 125 university students showed both increased grades and engagement among students who used Twitter compared to those who did not.[17] Our results support these findings in a larger cohort of students. We found that students who had successfully completed all aspects of the Twitter-related assessment performed better in the overall grades at mean difference of four percent, double the overall value of the task. This indicates that good students were more likely to complete the task and engage with the curriculum in general, compared to those who were not performing at a high standard. Further research is needed to investigate how much of this increased engagement, as measured by overall student performance, is directly linked to the Twitter task assigned.

In addition, Junco et al.'s work highlighted the benefits of Twitter when used to support students' academic engagement, psychosocial development, and also support their seven principles for good practice in undergraduate education.[17,18] In their study this was achieved through increased faculty student contact, cooperative and active learning, prompt feedback and communication of expectations.[13] Dunlap & Lowentahl similarly support these findings as their work shows that deliberate use of Twitter as an educational tool can lead to a culture of engagement and strong peer interaction.[9] We also found that students who completed the Twitter-related task reported increased interaction with staff and awareness of public health concepts compared to those who did not complete the task. However, our results differ in regards to peer interaction. Our cohort of students who did not complete the activity reported an increase in peer collaboration related to the activity relative to those who actually engaged in the task. This was an unexpected result but highlights that when students did not complete the task they perceived the value of this Twitter task differently. This suggests that reality may not be measuring up to students' expectations, indicating the need to improve the task to promote the peer interaction component.

Our results confirm that our students are already readily using social media platforms. This provides educators with an avenue to rethink our curricula and engage these students on their own terms whilst still providing sound pedagogical structure. This can be particularly beneficial in the case of Twitter, which is already used as a professional tool in various industries. Twitter has 320 million users with only 5-10% actively and regularly using the platform. Of this total it is estimated around 10% are using Twitter for professional topics rather than the discussion of personal information as found in Facebook. This equates to approximately 3.2 million users who share and Tweet about their interests or professional expertise.[3] This can be seen in medicine and public health where Twitter is being used by medical networks, public health advocates and relevant journals as well as individual professionals.[19] A primary example is the #publichealth hashtag used by many World Health Organisation staff to promote their health promotion campaigns, research, and latest health population data. This can be further seen as medical journals, conferences, and research facilities post their most cutting-edge findings using their own hashtags and followers to disseminate the information. Incorporating this technology into educational activities provides a landscape whereby universities foster and develop the skills of students, including their ability to engage in online communication with stakeholders beyond the classroom. It provides an opportunity for our audience of students to interact, not passively, but actively, with the health information available to them. It diversifies our pedagogies and promotes our students' receptiveness to interact with another mode of communication. Twitter remains an unexplored avenue for universities to connect with potential employers and build relationships that allow students an insight into the graduate attributes desired in the professional environment.[9] At a minimum it can help guide the development of student communication skills in the online environment.

Jenkins et al. define a participatory culture as one with ‘relatively low barriers to artistic expression and engagement,’ strong support for the creation and sharing of content, the potential for informal mentorship between experienced and novice participants, a space where all members feel their contributions are valued, and in which there is social connection among participants.[20] Using Twitter as an assessment tool seems to meet all of these criteria, thereby promoting the online classroom as an enriched, participatory environment.

The limitations of this study include that only first year students from the Bachelor of Biomedical Science degree at Monash University were recruited. These participants had all recently completed high school and few had previously been exposed to Twitter. It is reasonable to assume that older students or those who have used Twitter previously may perform differently on this task, as they could have a better understanding of the technology. However, the strength of study is the 80% response rate and the 100% survey completion. Despite this there is no doubt that lessons learnt from this assessment could be used to further develop the assessment with a focus on peer interaction, student attitudes and performance.

**Conclusion**

Use of social media as educational tools is positively viewed by students in terms of engagement with public content and increased staff interaction. The assumption that all students are digital natives and therefore are aware and engaged in
all modes of social media is misleading. Therefore, research is required to identify effective methods implementing social media interventions in education. Additional research is required to develop guidelines to promote e-professionalism and use of social media within the field of medical education.

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Nil.

Conflicts of interest
There are no conflicts of interest

References
Appendices

Appendix 1: Student Example Tweets (please examples to match)

Assessment task: Online contribution (2%)

Student Id:

AT1 task completed:

1. Dumb Ways to Die (1%) Yes/No
   a. Date completed__
   b. Which character did you end up with?________________

2. ‘Public health in daily life’ photo completed (1%) Yes/No
   a. Date completed__
   b. Describe photo tweeted and public health implication _________________________________________________________

3. Did you post more that required for this assessment? Yes/No
   a. On average how many extra times________

4. Prior to this activity, did you use any social media Yes/No
   a. Please circle the ones used:
      1. Facebook
      2. Instagram
      3. Twitter
      4. Google + other__________.

5. How did you access twitter? (Please circle the one used) Computer or mobile phone

6. Which of the following do you think AT1 achieved? (Please circle below) Yes/No
   a. Greater accessibility to staff
      1. Strongly disagree
      2. Disagree
      3. Neither agree nor disagree
      4. Agree
      5. Strongly agree.
   b. Promoted awareness of public health
      1. Strongly disagree
      2. Disagree
      3. Neither agree nor disagree
      4. Agree
      5. Strongly agree.
   c. Collaboration with peers
      1. Strongly disagree
      2. Disagree
      3. Neither agree nor disagree
      4. Agree
      5. Strongly agree.

7. Could this Twitter-related activity have any other applications in the unit? ________________________________

8. Do you think it was appropriate to use twitter to complete this assessment task? Yes/No
   If so why not______________________________
   Would you be interested in giving additional feedback about this assessment? Yes/No
Appendix 2: Questionnaire (please examples to match)

Task 1 – Dumb Ways to Die: Student tweets from the game and then identifying the activity while catching public transport

Task 2 – This is public health: Student identifying public health promotion of plain packaging of cigarettes and local transport safety campaign

Task 3 – It is in the media: Student post of media article in large local newspaper