"Tweet"-format reflective writing: A hidden needs assessment?

Jeremy A. Dressler [a, *], Beth A. Ryder [a], Kristina Monteiro [b], Erin Cheschi [a], Michael Connolly [a], Thomas J. Miner [a], David T. Harrington [a]

[a] Department of Surgery, Warren Alpert School of Medicine, Brown University, APC 4th Floor, 593 Eddy Street, Providence, RI, 02903, United States
[b] Office of Medical Education, Warren Alpert School of Medicine, 222 Richmond Street, Providence, RI, 02903, United States

ABSTRACT

Background: Medical student reflection is integral for professional development. Preliminary findings suggest that short-format writing promotes reflection and identifies impactful experiences. We sought to determine whether reflective writing could be used as a clerkship needs assessment.
Methods: During their surgical clerkship, medical students submitted "tweet"-format reflections and completed a standardized evaluation. "Tweet" content was analyzed using modified grounded theory methods and coded by valence, content, and reflection. Sub-coding was conducted to compare feedback between "tweets" and evaluations.
Results: We analyzed 286 reflections and 214 evaluation comments; 176 "tweets" were reflective (62%). "Tweets" commented on "patient interaction" (53%), "educational experience" (38%), "physician inter-action" (26%), and "career decisions" (10%). A significant difference was observed between "tweets" and evaluations with regard to the number that provided feedback on experiences with "critically ill or dying patients."
Conclusions: Reflections provided real-time reactions to impactful clerkship events, notably those involving critically ill or dying patients. This focus on illness may represent an unmet need for discussions related to end of life care. Overall, reflections provided more actionable feedback compared to evaluations.

© 2018 Elsevier Inc. All rights reserved.

Introduction

Reflection is an essential practice for medical students, allowing them to identify meaningful experiences to inform future decisions.[1–3] Fostering an educational environment that encourages reflection is paramount as reflective practice is not intuitive.[4–6] Previously, our pilot project indicated that a short-format reflective writing assignment completed during the surgery core clerkship could be an effective modality for promoting medical student reflection.[7]

In addition to serving as a reflective tool for student education, the "tweet"-format writing assignments referenced highly impactful student experiences providing actionable curricular feedback.[7] Prior to implementing this writing tool, our standard means of feedback for the clerkship included a 10–15 min mid-clerkship feedback session with the clerkship director, a 1 h group-format end-of-clerkship session with the clerkship coordinator, and a standardized electronic end-of-clerkship course evaluation. Past educational research has shown that, while feedback is crucial, standard methods such as these do not fully capture student experience, limiting our ability to implement effective changes to our clerkship.[8–10]

We sought to evaluate the content of "tweet"-format reflective writing beyond the pilot phase and to better understand the utility of student reflection as clerkship feedback by comparing narrative content of the assignments and open-response items from clerkship course evaluations. We hypothesized that the reflective writing assignment was superior to clerkship course evaluations in identifying high-impact content delivered during the surgery clerkship. We further surmised that, through the identification of these experiences, "tweet"-format writing could be used as a needs assessment to refine existing curricula as well as identify novel areas for improvement.

* Corresponding author.
E-mail addresses: Jeremy.Dressler@lifespan.org (J.A. Dressler), BRyder@usasurg.org (B.A. Ryder), Kristina_monteiro@brown.edu (K. Monteiro), erin.cheschi@lifespan.org (E. Cheschi), Mconnolly5@lifespan.org (M. Connolly), TMiner@usasurg.org (T.J. Miner), DHarrington@usasurg.org (D.T. Harrington).

Material and methods

During the 2016—2017 academic year, third year medical students at the Warren Alpert School of Medicine who were in the standard MD track were required to submit a reflective writing assignment during their surgical clerkship. Completion of the assignment was required to pass the clerkship although the assignment had no bearing on student evaluations. All written content was reviewed after students rotated off service and had their grades assigned. The assignment consisted of three, short-format submissions in the style of a post to the social media tool Twitter™. The tweets were submitted electronically through the Canvas™ learning management system. A character limit consistent with Twitter™ was suggested although not strictly enforced. During the study period, the character limit on Twitter™ increased from 140 to 280 characters. The subject matter of each tweet was left to the individual students. At no point were the writing assignments distributed electronically or made available on the either the internet or social media.

At the conclusion of the academic year, all submissions were de-identified and subsequently thematically coded using modified grounded theory. Similar to our feasibility study, *a priori* codes were created with regards to valence, content category, and presence of reflection, utilizing a binary adaptation of the REFLECT rubric, an analytical tool developed by Wald and colleagues at Brown University for reflective writing analysis.[11] We then performed a content category sub-code analysis for the tweets to identify recurring themes. Additionally, we extracted and de-identified comments from open-response items on required clerkship course evaluations from the Records and Registration system used at our institution. Evaluations were submitted anonymously by each student after completing the clerkship through the OASIS platform. All third year clerkships used the same form with the following prompts: 1) what were the clerkship's strong points? 2) what were the clerkship's weak points? These comments were then sub-coded in a similar manner as the written assignments.

A combination of Chi-squared and Fisher's exact tests were used to identify differences between the groups when appropriate. P-values less than 0.05 were considered significant. Tweet data from seven of eight student blocks were reviewed due to data loss during transition of staff. All eight blocks of clerkship course evaluation data were included in our analysis.

Four coders independently reviewed all writing assignments and surveys. In order to provide a comprehensive assessment, the coders were comprised of a surgical resident, a surgical faculty member, an administrator, and a behavioral scientist. We used an iterative process to reconcile all discrepancies. Our inter-coder reliability was a ratio of total agreements and total number of assignments coded. Quotes presented in the result section are identified by valence, content category and subcategory, and presence of reflection.

This project was approved by the Rhode Island Hospital Institutional Review Board as a quality improvement project (number: 966447—1).

Results

During the 2016—2017 academic year, 97 students submitted 291 writing assignments (100% completion rate). Two-hundred and eighty-six tweets were thematically coded with regards to content, valence, and presence of reflection; five assignments were excluded as they were comprised entirely of quoted material. An additional 214 clerkship course evaluation comments were collected from 107 students (98.2% completion rate). The overall median character length for the tweets was 148 (range: 20—1104). One hundred and

Table 1
Description of student reflections.

	Code	n	%
Valence	Positive	132	46
	Negative	84	29
	Indeterminate	70	24
Content	Patient Interaction	150	53
	Educational Experience	110	38
	Physician Interaction	74	26
	Career Choice	30	10
	None	3	1

thirty-three tweets were 140 characters or less in length (46.5%) and 252 tweets were 280 characters or less (88.1%).

Written submissions varied by both valence and content as shown in Table 1. A majority of tweets were positive (46%) although students also commented on negative experiences (29%). Most commonly, students wrote about patient interactions (53%) although educational experiences (38%), physician interactions (26%), and career choices (10%) were also mentioned. On review, no submitted content violated patient privacy as defined by HIPPA guidelines.

With regards to reflection, we achieved an inter-coder reliability of 76% prior to reconciling all discrepancies. One hundred and seventy-six submissions were coded as reflective (62%). Eighty-six students (89%) reflected in one or more tweets whereas 61 (63%) and 29 (30%) students reflected in two or more and all three tweets, respectively. Eleven students (11%) failed to reflect in any of their tweets. We observed a positive association between increasing character length and reflection (p < 0.01) as depicted in Table 2. One hundred and thirty-three tweets were less than or equal to 140 characters, of which 67 (50%) were reflective. Two hundred and fifty tweets were less than or equal to 280 characters, of which 145 (58%) were reflective. Of the 34 tweets greater than 280 characters, 31 (91%) were reflective.

After initial coding was complete, four sub-themes were identified, "critically ill or dying patients," "misconceptions of learning," "collaboration," and "mistreatment of others." We defined "critically ill or dying patients" as student reflection involving caring for sick patients or witnessing patient death or suffering. "Misconceptions of learning" was defined as the recognition of the clerkship exceeding or failing to meet an educational expectation. We defined "collaboration" and "mistreatment of others" as student reflections pertaining to teamwork and perceived unfair treatment of students or medical staff in the setting of patient care, respectively. Examples of coded tweets are included in Table 3.

Subsequently, in order to assess feedback, we compared sub-coding between assignments and evaluations (Table 4). Fifty-one patient interaction tweets sub-coded as addressing "critically ill or dying patients" compared to zero of the clerkship course evaluations (p < 0.01). A similar difference was seen in the physician interaction category as tweets commented on "collaboration" (p < 0.01) and "mistreatment of others" (p = 0.08) more frequently than the clerkship course evaluations although the latter failed to reach statistical significance. There was no difference in student reports of "misconceptions of learning" across tweets and evaluations (p = 0.35).

Table 2
Length and proportion of reflective of assignments.

	Character Count Range		
	≤140	≤280	>280
Reflective (%)	67 (50)	145 (58)	31 (91)
Non-Reflective (%)	66 (50)	107 (42)	3 (9)

Table 3
Examples of tweets.

Tweet	Coding	Sub-Code
"It didn't hit me hard the first time I saw a patient die because it was so definitive. It was much harder seeing the conversation with the family, the people left behind to mourn."	Patient interaction Negative Reflective	Critically Ill or Dying Patients
"Saw my first emergent trauma surgery a couple days ago. Amazing how fluidly the OR team and surgeons worked in such a hectic environment."	Physician Interaction Positive Reflective	Collaboration
"We are told to be engaged, ask questions, and be helpful but what I have quickly learned is that the most important skill is to be out of the way and stay quiet. It's unfortunate but it's the reality in the surgery clerkship."	Physician Interaction Negative Reflective	Mistreatment of Others
"Being in the OR is a fun and valuable experience, but I have also really appreciated PM rounds when we can take things slower and get lots of teaching in as well."	Educational Experience Positive Reflective	Misconceptions of Learning

Table 4
Sub-code analysis.

Category	Sub-code	Tweets (n = 286)	Evaluation Comments (n = 214)	P-value
Patient Interaction	Critically Ill or Dying Patients	51 (18%)	0 (0%)	<0.01
Educational Experience	Misconceptions of Learning	42 (15%)	38 (18%)	0.35
Physician Interaction	Collaboration	21 (7%)	3 (1%)	<0.01
Physician interaction	Mistreatment of Others	13 (5%)	4 (2%)	0.08

Discussion

Reflective learning continues to play a critical role in medical student education. The act of revisiting clerkship experiences allows students the opportunity to develop their clinical knowledge, professionalism, and interpersonal skills by encouraging a way for thought consolidation and a method for working through cognitive dissonance. These attributes are components of the ACGME core competencies.[12]

After a year of data collection, our findings support our previous report that medical students are able to reflect using short-format reflective writing. Most tweets were reflective, as nearly 90% of students were able to reflect in at least one of their tweets. Students were also able to adhere to our proposed character limit. Two hundred and fifty-two submissions (88%) met or were under 280 characters, the current limit set by Twitter™. Of these, 145 (58%) were coded as reflective. While this rate of reflection with a lower character count was less than anticipated, all but three reflections occurred below 600 characters. In comparison, an average typed page contains over 3000 characters, suggesting that short-format writing can be a feasible modality for promoting student reflection.

Students commented on a wide spectrum of topics, both positive and negative, favoring content involving patient interaction and educational experience. Initially we were concerned that students would only comment on positive experiences since their tweets were not anonymously submitted. The relatively even distribution of valence indicated to us that student tweets were honest representations of their clerkship experience. As we reviewed the reflections in greater depth, we realized that the students' commitment and enthusiasm for the assignment was outstanding. The most impressive aspect of their reflections was the detail with which they recounted impactful experiences from their clerkship.

Through our sub-code analysis, we were able to identify four main themes to further define what students considered most impactful. "Critically ill or dying patients" was the most prevalent sub-code (34% of tweets in the "patient interaction" category). We think this is likely representative of the fact that the surgical clerkship provides the students' first interactions with sick and/or dying patients during their third year. As we began to notice this trend, we spoke with clerkship students who confirmed that this was true, even well into the third year of medical school after completing several other core clerkships.

Three additional commonly tweeted content themes, "collaboration" in the setting of patient care, "mistreatment of others", and "misconceptions of learning" were noted. This may be related to students working as a part of patient care teams outside of the classroom, likely exposing them to the benefits and challenges of the inpatient healthcare environment for the first time. Based on the content of the submitted material, it seems that students also had pre-conceived notions as they entered the clerkship that differed from their actual experience. They faced situations involving practitioner error and patient safety. They interacted with attendings who used varying styles of teaching, some more effective than others. They also commented on resident leadership and education styles, noting varying levels of competency.

In retrospect, prior to the implementation of our reflective writing assignment, we had poor insight into what students considered most impactful during their surgical clerkship, as data from our clerkship course evaluations and feedback sessions was relatively superficial. When we coded evaluation open-response items into the same sub-codes as the tweets, we noted a significant difference in content. Students were more likely to comment on "critically ill or dying patients", "collaboration", and "mistreatment of others" in their reflective writing assignment. We believe this is due to two important factors. One, the reflective assignment prompt was open ended and without the context of an educational evaluation. This allowed students to choose any experience about which to write. In contrast, by asking students to provide feedback on the clerkship, the traditional evaluations biased student responses towards commenting on their educational experience, limiting the range in student responses. Secondly, the reflective assignment was submitted in real time. This gave students the ability to reflect on experiences in close proximity to when they occurred, likely adding to the richness of the short narratives. Clerkship course evaluation detail likely suffered as these were completed at the conclusion of the clerkship, while students were beginning their next rotation. In addition, students were required to complete additional evaluation forms at the end of the clerkship to provide assessments of faculty and residents. Therefore, we suspect many students suffer from evaluation fatigue, which

generated bland content.[13,14]

Tweet reflections did not statistically provide an advantage over clerkship course evaluations with regards to reporting "misconception of learning." However, when examining the content closely, the detail with which impactful experiences are recounted in the tweets was much greater than the clerkship course evaluation comments. For example, as compared to the student who highlighted the importance of afternoon teaching rounds as an educational tool outside the operating room (Table 3), on an evaluation a student simply wrote, "I did not feel adequately prepared for my shelf exam." While this evaluation comment provided important feedback, it did not provide the same level of actionable information for clerkship improvement as the above tweet.

We identified two major areas of concern when reviewing the full year of tweets. First and unfortunately, some students experienced mistreatment and/or unprofessional behavior during their surgical clerkship. Students were and continue to be encouraged to approach clerkship and university leadership with any issues, which are then handled on an individual basis. Additional institution-wide mechanisms exist for reporting mistreatment at our university. Our commitment to improving the learning environment is an ongoing endeavor. Second, 11 students (11% of the class) failed to achieve reflection with any of their tweets. This finding could be a result of the following: student inability/lack of effort to reflect, clerkship experience that did not stimulate reflection, or an error in coding with failure to identify reflection. Future efforts will be geared to address these three potential issues and engage the students in the assignment.

Our work was limited in several ways. Pre-clerkship education on reflection was not standardized, although students did have experience with reflective writing during their MS2 year. Formal didactics on reflective practice may further enhance student learning. Individual students also had an opportunity to provide feedback during an end-of-rotation interview with the clerkship coordinator. We did not thematically analyze content received during these sessions, which could be an interesting comparison to student reflections, although content is generally similar to the clerkship course evaluations. Lastly, student tweets were not anonymous. This may have biased students to report positive comments more likely than negative or critical comments. To minimize the effect of lack of anonymity, we de-identified and reviewed the content only after grades were submitted. As the data show, many students were comfortable submitting negative and/or critical content, which we think likely makes the comments representative of students' actual experience.

Conclusions

"Tweet"-format reflective writing is an effective tool for cultivating medical student reflection. Through this writing assignment, students generated a new source of data from which to extract clerkship feedback. Student tweets achieved reflection and provided more detail regarding impactful experiences when compared to standard clerkship course evaluations completed at the end of the rotation evaluations. This reflective writing assignment not only benefited students in their educational development, but also provided educators with actionable information to improve the clerkship.

Conflict of interest

The authors report no conflict of interest.

Funding source

Acknowledgements

References

1. Schön D. *The Reflective Practitioner: How Practitioners Think in Action*. London: Temple Smith; 1983.
2. Boud D, Keogh R, Walker D. *Reflection: Turning Experience into Learning*. London: Kogan Page; 1985.
3. Charon R. Narrative medicine: a model for empathy, reflection, profession, and trust. *Jama*. 2001;286(15):1897—1902.
4. Reis SP, Wald HS, Monroe AD, Borkan JM. Begin the BEGAN (The Brown Educational Guide to the Analysis of Narrative)—A framework for enhancing educational impact of faculty feedback to students' reflective writing. *Patient Educ Counsel*. 2010;80(2):253—259.
5. Wald HS, Reis SP. Beyond the margins: reflective writing and development of reflective capacity in medical education. *J Gen Intern Med*. 2010;25(7): 746—749.
6. Mann K, Gordon J, MacLeod A. Reflection and reflective practice in health professions education: a systematic review. *Adv Health Sci Educ*. 2009;14(4): 595.
7. Dressler JA, Ryder BA, Connolly M, Blais MD, Miner TJ, Harrington DT. "Tweet"-Format writing is an effective tool for medical student reflection. *J Surg Educ*. 2018 Sep - Oct;75(5):1206—1210.
8. Thomas PA. *Curriculum Development for Medical Education: A Six-step Approach*. JHU Press; 2015.
9. Holla SJ, Ramachandran K, Isaac B, Koshy S. Anatomy education in a changing medical curriculum in India: medical student feedback on duration and emphasis of gross anatomy teaching. *Anat Sci Educ*. 2009;2(4):179—183.
10. Jones R, Higgs R, De Angelis C, Prideaux D. Changing face of medical curricula. *Lancet*. 2001;357(9257):699—703.
11. Wald HS, Borkan JM, Taylor JS, Anthony D, Reis SP. Fostering and evaluating reflective capacity in medical education: developing the REFLECT rubric for assessing reflective writing. *Acad Med*. 2012;87(1):41—50.
12. Team NK. *Exploring ACGME Core Competencies: Professionalism*. 2017. Accessed April 2018, 2018.
13. Porter SR, Whitcomb ME, Weitzer WH. Multiple surveys of students and survey fatigue. *N Dir Inst Res*. 2004;2004(121):63—73.
14. Adams MJ, Umbach PD. Nonresponse and online student evaluations of teaching: understanding the influence of salience, fatigue, and academic environments. *Res High Educ*. 2012;53(5):576—591.