To Tweet or Not to Tweet, That is the Question: Testing Social Media Effects in Medical Education

Research Highlights
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Purpose: Many medical education journals use social media, especially Twitter, to highlight research findings and garner attention for their articles (1-2). However, it is unknown whether this type of social media engagement effects article dissemination, as measured by article-level metrics like page views. In this study, we tested the effects of social media engagement specifically, tweets by a single medical education journal, Academic Medicine (AM)on article page views. We hypothesized that, on average, tweeted articles would receive more page views than articles not tweeted.

Methods: We conducted a randomized control trial to assess the effects of journal tweets on article page views. We focused on articles published in 2015 because they are contemporary and also publicly available on the AM website. We excluded articles published after 2015 because AM has a policy to tweet all new articles, and did not want to disenfranchise authors. The following five publication types were included: Research Reports, Articles, Innovation Reports, Perspectives, and Reviews. Articles were randomly assigned to a Twitter (case) or control group. Daily, at noon Eastern Time, a tweet was generated for each article in the Twitter group; the tweet included article title, #MedEd, and an Ow.ly link to the article. Beginning on 5 February 2018, the generated tweet was posted via Hootsuite to AMs Twitter account. Individual article tweets continued until all articles in the Twitter group were tweeted (10 May 2018).

We extracted page view data directly from the publishers website. To assess the differences in page views between the case and control groups, we used a time-centered approach with outcomes measured at 1, 7, and 30 days. For each article at each time point, we assessed three metrics: (1) unique visitors, (2) HTML full-text page views, and (3) PDF full-text views. In light of the data distribution, we used a negative binomial regression model.

Results: In total, 189 articles (94 cases, 95 controls) were analyzed. After the first day of tweets, there were no statistically significant differences between cases and controls on any of the page-view metrics. However, on day 7, cases in the unique visitor category averaged 4.0 visits, whereas controls averaged only 2.5 (SD=7.9 for cases and 3.9 for controls). The model revealed a 55% increase in tweets for cases as compared to controls. On the other hand, HTML full-text page views and PDF full-text views did not differ between cases and controls. Finally, on day 30, tweeted articles averaged 20.3 visits in the unique visitor category, whereas controls averaged 13.0 (SD=62.4 for cases and 19.1 for controls). In the model, there was a 57% increase in tweets for cases over controls. Similarly, HTML full-text page views averaged 14.7 for cases and 9.0 for controls (SD=63.7 for cases and 14.3 for controls). Results from the model suggest a 63% increase in tweets for cases as compared to control. There were no differences between cases and controls in the category of PDF full-text views on day 30.

Discussion: Consistent to our hypothesis, we found several statically significant differences between the Twitter and control groups. Taken together, AM articles that were tweeted received,
average, more page views than those that were not. Moreover, for the comparisons that did not emerge as statistically significant in the regression models, all but one of the page view metrics trended in the expected direction.

**Significance:** Considering the fairly simple nature of the social media strategy employed here i.e., a single journal tweet to promote a given article these results are promising. Use of more comprehensive social media strategies, and their effects on article dissemination, should be tested in a similarly rigorous manner.
Impact of the GEA Regional Grant Program through the Lens of Social Cognitive Career Theory: A Mixed Method Evaluation

Research Highlights
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Purpose: Funding for medical education research is rare (1), which poses challenges to medical educators studying medical education outcomes. Among existing grant programs, few have systematically examined impact on grantees (2). This study examines the impact of one program, on research outcomes and the development of research capacity more broadly. For over 10 years, the AAMCs Group on Educational Affairs (GEA) has awarded small educational grants to medical school- affiliated faculty, staff and learners in order to promote scholarship and collaboration. This study examines if and how the grantees careers were affected by funding; and what professional and scholarly outcomes resulted, including research productivity (e.g., publications) and professional development opportunities (e.g. networking, research program development).

Methods: We MESRE (Medical Education Scholarship, Research and Evaluation) representatives from each GEA region are conducting an IRB-approved evaluation of the GEA regional grants program. The evaluation utilizes the theoretical framework of Social Cognitive Career Theory (SCCT) (3), which posits that the person-environment interaction forms learning experience that, in turn, influences perceived confidence in ones abilities to perform career-related tasks and activities (i.e., career self- efficacy) and the types of outcomes one expects as a consequence of given career pursuits (i.e., outcome expectations). Four sources of information inform these processes, including mastery or vicarious experiences (e.g., being successful or having successful models), social/verbal persuasive communications (e.g., acknowledgement), and positive affective reactions (e.g., anxiety management).

The mixed methods project focuses on 56 grantees funded between 2010 and 2015. Quantitative data includes information abstracted from administrative records regarding the characteristics of grantees and their teams, program design, and amount and use of awarded funds. These records are supplemented with grantees curriculum vitae to quantify research productivity (e.g., presentations, publications). Qualitative data includes in-depth interviews with a subset of grantees from each region. MESRE representatives interviewed grantees from other regions using a narrative inquiry approach (4) and interviewer guide. Interviews explore the impact of grants (if any) on the (transformation of) individuals and teams receiving the funds. Interviews with 24 grantees have been completed and transcribed, with thematic analysis underway.

Results: Preliminary findings suggest that the SCCT is a useful framework for understanding programmatic impact. This appears to be true for both junior grantees as well as those with more research experience. For example, both might report changes in mastery resulting from funded projects. However, while junior grantees describe successful experiences of conducting research, more experienced grantees discuss successful mentoring of research for junior team members. Other observed differences include motivation for grant submission, types of productivity, and
career outcomes.

**Discussion:** In an environment where medical education research funding is rare, receiving any grant, even if small and without protected research time, can prove impactful for grantees. The SCCT offers insight into the mechanisms by which those impacts occur and could help shape programs. If medical educators are to bring evidence-based education to fruition, funding programs such as the GEA regional grants programs must continue.

**Significance:** Small grant funding can have an important impact on medical education researchers, fostering additional research and development of skills.
Scholarship Network Analysis of Accelerating Change in Medical Education Consortium

Research Highlights

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Purpose: The American Medical Association formed the Accelerating Change in Medical Education Consortium in 2013. The initial group of 11 schools was expanded in 2016 to the current 32 institutions, impacting approximately 19,000 medical students. As the goal of the consortium is to impact change in undergraduate medical education, scholarship of the educational innovations is important for dissemination. This purpose of this study was to look at the scholarship network among the consortium institutions.

Methods: Consortium schools submitted semi-annual reports of publications related to their grant. Each publication was coded for number of citations, altmetric, domain of scholarship, and collaboration of authors across the consortium. Three investigators coded domain of scholarship through an iterative process and determined whether a submitted article was genuinely a derivative of consortium work through a consensus approach. IRB was not required due to public availability of publications and not human subject research.

Results: Over 5 years, the consortium members produced 168 publications, ranging from 38 publications from one institution to no publications for 6 institutions. Thirty of the articles were published across consortium institutions. When examining the domains of scholarship, 92 papers were about health systems science with 15 of these further focused on population health, 16 on informatics or analytics, and 12 on interprofessional education. Thirty paper were about competency/assessment.

Fifty-three papers were published in Academic Medicine. The average number of citations was 8 per article with the range from 0 to 79 citations) and 11 altmetric score. The majority of publications came from the first cohort of schools (who were engaged in the consortium for longer and who have significantly more funding - over a million dollars each than the second cohort).

Discussion: Medical education consortia can be a meaningful source of scholarship. Although each school in the Accelerating Change in Medical Education Consortium is working on its own independent project, the consortium generated an equally important effect of supporting collaboration across schools on common educational innovations. For example, the consortia focus on Health Systems Science (and associated curriculum development, faculty development, and assessment) is reflected in the analysis demonstrating a significant number of publications in this domain. This analysis demonstrates the relational drivers of scholarship of this consortium. Further, the funding of the initial grant likely helped the schools in ways that contributed to their scholarship, especially the first cohort.

Significance: The Accelerating Change in Medical Education consortium has had significant impact in publications addressing topics in undergraduate medical education innovation. Development of such deliberate mechanisms to improve collaboration across schools and increase networks of collaboration is one method to remove siloes and create standardization of key
innovations across medical education programs.
Promoting Foundational Lifelong Learning: Advancement of Research and Scholarship Through the ResQIPS Framework

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Purpose: Sustained commitment to advancing research, quality improvement (QI) and patient safety (PS) is an important aspect of resident education and faculty/preceptor development. Scholarship is a core requirement of graduate medical education (GME): however programs often receive citations for lack of scholarly activity. Clinicians must be well-versed in research, QI and applying research findings to improve patient care. Busy clinicians often lack the training, resources or support needed to bring important clinical questions from idea to project execution. Practicing physicians also need to understand the principles of QI due to legislative changes.

Methods: We developed an innovative framework and curriculum called “ResQIPS” (Research, Quality Improvement and Patient Safety) linking education and support on QI/PS activities to scholarship with the intent of increasing scholarly projects and improving outcomes for the network’s medical residency programs and, more broadly, across multiple disciplines in the network.

A librarian-led, interprofessional committee comprised of representatives from GME faculty, Academic Affairs, HonorHealth Research Institute, QI/PS, Nursing, Pharmacy and Library Services collaborated beginning in the Fall of 2016 to develop the ResQIPS framework. Within the ResQIPS framework, a research education curriculum was developed linking organizational and national initiatives into medical education. Our Masters-prepared medical librarians were a unique choice and natural fit to oversee this project due to their competence in research principles, knowledge of resources, and experience with working across multiple disciplines on QI, research, evidence-based projects and clinical decision support. The program was rolled out in 2017.

To date, three half-day workshops have been held, with individual mentoring support offered between workshops. Projects have been supported by statistician, QI, PS, Library consultations, and assistance with Institutional Review Board submission. Post-workshop needs assessment data has been incorporated into subsequent ResQIPS program planning, facilitating project continuity and supporting professional development. The librarians have also created a ResQIPS website to make presentation materials available after each workshop (http://my.honorhealth.com/resqips/) and have provided flashdrives with resource materials to support participants ongoing work on their projects between workshops.

Results: Participants (n=63 in 2017; n=141 in 2018) report high levels of satisfaction with instructional approach, curriculum and delivery model and increased understanding of key research principles.
Resident scholarship significantly improved. Volume/completion of residency program Research and QI projects were compared pre- and post-program inception. Residency programs reported a 28% increase in projects due to organizational efforts including the ResQIPS series and framework. QI/Research projects including care transition projects, CLABSI prevention, midnight rounding and
opioids management were showcased to the organization in Spring of 2018.

**Discussion:** The ResQIPS program has made a significant impact on resident scholarship and has promoted interprofessional collaboration. In addition to changing the culture towards a spirit of inquiry, project contributions, especially those of organizational importance (Bundle compliance, Opioids, CLABSI) have been recognized by the C-suite. The series is now accredited for continuing medical education, ACPE (pharmacy education) and ANCC (nursing), which creates a truly IPE learning environment.

**Significance:** Our aim is to equip residents, faculty and our inpatient team with skills for lifelong inquiry into practice. We have received a 2-year, $220,000 grant funding to scale the educational program for the network. Other goals in 2019 include integrating more hands-on case-based learning for participants and identification of better measurement tools to capture and quantify the success of the program, linking to institutional goals.
Medical Librarians as Curricular Designers in Quality Improvement and Patient Safety

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Purpose: Sustained Medical libraries have undergone a significant role change with the increasing availability of online resources. and are increasingly playing newer roles in education and informatics and scholarship.

We will present an educational innovation that is led by librarians in GME and CME aimed at furthering scholarship and lifelong.

Sustained commitment to advancing research, quality improvement (QI) and patient safety (PS) is an important aspect of graduate medical education (GME). Clinicians must be well-versed in inquiry: research, QI to improve patient care. Faculty often lack the training, resources or support needed to bring important clinical questions from idea to project execution and dissemination. faculty need to understand the principles of QI due to the legislative changes. Within community based teaching hospitals, the focus of QI has traditionally been around hospital based value based metrics and resident and medical student participation is often conducted by faculty and is not linked to health system initiatives.

In order to change the culture of inquiry, we proposed the ResQIPS framework.

Methods: We developed the ResQIPS (Research, Quality Improvement and Patient Safety) program in 2016, linking education and support on QI and PS activities to scholarship within the library. The primary audience is residents, students and faculty. A librarian-led, interprofessional (IPE) committee comprised of representatives from GME, Research, QI, PS, Nursing, Pharmacy and Library collaborated beginning in the Fall of 2016 to develop and implement a curriculum for scholarship which became known as ResQIPS. Our Masters-prepared librarians were a unique choice to oversee this project due to their competence in research principles, experience with working across multiple disciplines in the network on QI, research, evidence-based projects and clinical decision support. The program was rolled out in 2017.

To date, three half-day workshops have been held, with individual mentoring support offered between workshops. The projects have been supported by statistician, QI, PS, Library consultations, assistance with Institutional Review Board.

Post-workshop needs assessment data has been incorporated into subsequent ResQIPS program planning, facilitating project continuation and supporting professional development throughout the organization. The librarians have also created a ResQIPS website to make presentation materials available after each workshop (http://my.honorhealth.com/resqips/) and provided resources including project management.

Our medical librarians teach parts of the course and are actively involved in furthering the spirit of inquiry amongst the residents.
**Results:** Participants (n=63 in 2017; n=141 in 2018) report high levels of satisfaction with instructional approach, curriculum and delivery model and increased understanding of key research principles. Residency programs reported a 28% increase in projects due to organizational efforts including the ResQIPS series and framework. QI/Research projects including care transition projects, CLABSI prevention, midnight rounding and opioids management were showcased to the organization in Spring of 2018. The series is accredited for continuing medical education, ACPE (pharmacy education) and ANCC (nursing), which creates a true IPE learning environment.

**Discussion:** The ResQIPS program has made a significant impact on resident scholarship. In addition to changing the culture towards a spirit of inquiry. Project contributions, especially those of organizational importance (Bundle compliance, Opioids, CLABSI) have been recognized by the C-suite and the board. We have received a 2-year, $220,000 grant funding to scale the educational program for the network.

**Significance:** As technology becomes an integral part of our lives, the spirit of inquiry is a vital “core competency” of medical education in the Internet of Things era, curricula have to keep pace with advances. Academic and health system leaders must reexamine partnerships and question traditional roles. The success of this program provides us an opportunity to continue to examine and innovate the curricula and partner with the broader inter-professional team, especially librarians.