Using Slack to Facilitate Virtual Small Groups for Individualized Interactive Instruction

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ABSTRACT

Individualized interactive instruction provides an opportunity for significant innovation and advances in curriculum design. We describe the development and implementation of virtual small group exercises into the curriculum of an emergency medicine residency training program using a free social media and communication platform (Slack). Two virtual small group exercises, one case-based and one open-ended, were trialed during the 2016 to 2017 academic year. We found that the exercises were feasible to implement in a learner group where 66% (41/62) had little or no prior experience with Slack. There was a trend toward a more favorable rating of the quality of the dialogue and of the task-technology fit for the case-based format as opposed to the open-ended educational activity.

NEED FOR INNOVATION

The Accreditation Council for Graduate Medical Education (ACGME) Residency Review Committee for Emergency Medicine (RRC-EM) allows residency training programs to use individualized interactive instruction (III) to replace up to 20% of planned educational experiences.¹ The ACGME RRC-EM does not narrowly define III, but instead allows educational experiences to qualify so long as 1) the program director monitors resident participation, 2) there is an evaluative component, 3) there is faculty oversight, 4) and the activity is monitored for effectiveness. This broad guidance from the ACGME RRC-EM allows an opportunity for curricular innovation and integration of new technologies to meet the needs of modern learners. The best practices for these curricular innovations have not been well established and are an open area for education research.

BACKGROUND

To date, published descriptions of III curricula in emergency medicine residency training have followed a consistent structure. Residents either self-identify or are provided with educational resources to review in an asynchronous fashion. The resident's participation in, and effectiveness of, the educational activity is then assessed by means of a written examination or through a written reflection. Kornegay and colleagues² found that the implementation of such a curriculum was feasible and well accepted by learners and did not result in a detectable decrease in performance on in-training examination scores. As self-identification of high-quality online educational resources is problematic,³ Lin and colleagues⁴ developed a process by which quality educational resources can be identified and integrated into an III curriculum.

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While the published descriptions of III are relatively easy to implement, are well accepted by learners, and meet the requirements set forth by the ACGME, their utilization of modern communication technologies to facilitate social communication and learning is limited. Asynchronous online discussions have been used extensively in distance learning, including in health professions education,⁵ and can be used to foster the development of virtual communities of practice for geographically and temporally isolated learners.⁶ Online asynchronous discussions are particularly well suited to a social constructivist approach to instructional design.⁷ In this theory, learning is socially mediated, and new knowledge and skills are constructed, or scaffolded, on existing knowledge.^{8,9} There are no descriptions of the implementation of asynchronous online discussions to serve as III as defined by the ACGME.

The factors that contribute to increased learner participation in, and satisfaction with, asynchronous online discussions is an active area of research. Gilbert and Dabbagh¹⁰ found that having a structured facilitator guide and distributing participation expectations and evaluation rubrics to learners encouraged more meaningful discourse. They also found that limiting the length of learner posts and requiring citations negatively impacted meaningful discourse. Bradley and colleagues¹¹ found that the type of questions asked by the facilitator influenced the quantity and quality of dialogue, with brainstorming and direct link questions encouraging higher-order thinking. The presence of the facilitator also plays a key role in encouraging robust dialogue. Mazzolini and Maddison¹² found decreased length and number of learner responses in groups where facilitators posted frequently. Likewise, An and colleagues¹³ found less interaction between learners in online discussion groups when the facilitator was more active.

OBJECTIVE OF INNOVATION

The objective was to investigate the feasibility and value of incorporating asynchronous online small group exercises using a free social media and communication platform (Slack).

DEVELOPMENT PROCESS

The idea for, and design of, the virtual small group exercises was heavily influenced by the social constructivism educational theory. A direct dialogue between learner and teacher allows the teacher to identify the

gap between the learner's existing understanding of a concept and the desired level of understanding (zone of proximal development). Within this dialogue, the learner and teacher can explore any number of facets of a clinical problem, be it a core pathophysiologic understanding or be it the operational implications of a particular course of action in the care of a patient. In this way, an asynchronous online discussion opens up the possibility for the construction of a deeper and more robust understanding of clinical concepts, tailored to the specific needs of the individual learner.⁷⁻⁹

At the beginning of each month, residents were divided into six small groups. Each small group consisted of a core faculty member serving as facilitator and approximately six residents of all training levels (PGY-1 to -4). Using the residency's Slack team, each group was assigned to a private channel on which the exercise was conducted. The authors of this paper served as "Slack super users" and were available both in-person and online to troubleshoot any technical issues that arose during the trials.

We developed and distributed a facilitator guide to each small group facilitator at the beginning of each month (Data Supplement S1, Supplement 1, available as supporting information in the online version of this paper, which is available at <http://onlinelibrary.wiley.com/doi/10.1002/aet2.10201/full>). The facilitator guide outlined educational goals and objectives for each week, including specific prompts that were copied and pasted into the Slack timeline along with guidance for additional discussion. The case construction and objectives were designed to be similar to objectives that could be implemented in a traditional in-person small group exercise. The intent was to encourage the dialogue between facilitator and learner that characterizes synchronous small group activities while incorporating objectives that could otherwise not be easily accomplished during an in-person small group (e.g., searching online for evidence and providing a critical analysis of that evidence). We instructed the facilitators to guide the discussion as they would if they were leading an in-person small group session, with an importance placed on asking follow-up questions and calling on less engaged members of the group.

We used a rubric to evaluate resident participation (Data Supplement S1, Supplement 2). We defined meaningful participation as the sharing of knowledge and experiences, to include the sharing and discussion of primary literature relevant to the subject of discussion. Residents were expected to respond to at

least one facilitator-initiated discussion and to at least one other small group participant. We defined substandard participation as brief and limited engagement in the discussion where the learners' responses lacked specificity, evidence-based discussion, and experiential perspective. Each small group facilitator was tasked with tracking and assessing resident participation with oversight provided by a member of the residency leadership team. We distributed the evaluation rubric and discussion expectations to the residents at the start of each month.

THE IMPLEMENTATION PHASE

We first trialed the virtual small group exercises in our curriculum during March and May of 2017. The concept for, and objective of, the educational activity was introduced to the residents via email and with a brief in-conference presentation. We collected pre-implementation data on the baseline characteristics of our learners including familiarity with the Slack platform and existing use of technology. Following each month, a post-implementation survey was distributed to learners and moderators and assessed attitudes towards the learning experiences, task-technology fit, facilitator presence, perceived quality of discussion, and the perceived time value of the experience. We also analyzed the transcripts of the discussions looking at total word count, moderator response time, and number of educational resources shared.

The structure of the small group exercise in March differed from that in May. In March, each small group was tasked with identifying a common pain-related chief complaint and researching the literature supporting an alternative to opiates for pain control (e.g.

evidence supporting non-opiate means to control pain in symptomatic ureterolithiasis). The residents were asked to develop a position statement describing the evidence supporting their chosen treatment. In this iteration, the faculty facilitator aided in the identification of a pain-related complaint, assessed resident understanding of the treatment options, and probed for a deeper understanding of the quality of the found literature and how it applied clinically to patients presenting to the ED.

In May, the virtual small groups were presented with a case-based scenario with the structure of the discussion being similar to an oral boards case. The scenario for this month revolved around a patient presenting with shortness of breath who initially appears to have symptoms consistent with a COPD exacerbation. However, with further questioning and through the results of diagnostic tests, the patient is found to have a combined respiratory alkalosis and metabolic acidosis, leading to the ultimate diagnosis of salicylate toxicity. During the course of the month, the faculty facilitator was tasked with communicating key pieces of information related to the case, responding to resident questions, and probing the residents understanding of the pathophysiology of COPD and salicylate toxicity as well as the clinical implications of management decisions. Starting in the 2017–18 academic year and moving forward, we have scheduled virtual small group exercises quarterly in our curriculum based on resident feedback.

EVALUATION

Baseline experience with Slack was low with 66% (41/62) of respondents having little to no knowledge of the platform. Overall, residents perceived that their

Table 1
Characteristics of March and June III

Characteristics of Small Group Transcripts	March Mean (±SD)		June Mean (±SD)	
Total Messages	59 (±19)		32 (±9)	
Group Facilitator Messages	17 (±9)		12 (±4)	
Resident Messages	42 (±12)		19 (±5)	
Total Educational Resources Shared	13 (±4)		7 (±1)	
Word Count	3754 (±1050)		2958 (±625)	
Resident Perceptions	<i>n</i> (%)	<i>n</i> (%)	Difference	95%CI
Slack was well-suited to a virtual small group exercise	23 (54.8%)	21 (72.4%)	17%	−4.5% to 39.8%
Quality of the dialogue	21 (50.0%)	20 (69.0%)	19%	−3.7% to 41.6%

Resident perceptions were assessed using a 1–5 Likert scale. Both questions were categorized (1–3 “no”, 4–5, “yes”) and tested for differences using the chi-square test. The *p* value did not quite meet significance, and the CIs did cross zero.

III = individualized interactive instruction.

efforts in the activities were worth 1.18 hrs of conference time which was not significantly different than faculty perceived time value of resident participation of 1.05 hrs.

In comparing the March and May activities, the case-based format of the May activity was preferred by the residents as compared to the more open-ended format of the March activity. As seen in Table 1, there was a trend towards a more favorable rating of the quality of the dialogue and the task-technology fit in May as compared to March. Though the quality of dialogue was rated higher in May, the quantity of messages sent and the total word count was less in May as compared to March.

REFLECTIVE DISCUSSION

The introduction of an unfamiliar technology poses significant challenges. Though the nature of the communication on the Slack platform is immediately familiar to most in this generation of learners, the use of the application was not. Push notifications and ensuring notifications settings are set to alert learners of new activity are technical solutions to the challenge of integrating a new technology into the educational routine of learners. There are a number of other factors that may contribute to the successful implementation of these educational activities including duration of discussion, structure and content of the activity, and the role of the moderator in the discussion.

Asynchronous online discussions represent a promising instructional method for ILL. By taking advantage of social media and communication platforms, they offer an opportunity for faculty-resident and resident-resident dialogue, a sharing of common problems and experiences, and the social construction of knowledge. Further study is needed to identify the factors that maximize the successful implementation of these educational activities.

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Supporting Information

The following supporting information is available in the online version of this paper available at <http://onlinelibrary.wiley.com/doi/10.1002/aet2.10201/full>

Data Supplement S1. Supplemental material.