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Letter

Motivating medical students by utilizing dermatology-oriented online quizzes

Elaine Kunzler BS, Jacqueline Graham MD, Eliot Mostow MD

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Northeast Ohio Medical University

Correspondence:

Elaine Kunzler
1677 Fixler Rd,
Wadsworth, OH, 44281
Tel. (330) 903-1024
Email: ekunzler@neomed.edu

Abstract

Background: Online quiz competitions can facilitate extra-classroom interactions between faculty and medical students. Owing to decreased class attendance nationwide, teaching faculty might revamp their approach to medical education by providing online resources and methods for communication.

Objective: To explore if the use of online quizzes and social media can result in improved interactions between faculty and students.

Methods: A pilot study conducted from April 7th, 2015 to June 11th, 2015 at Northeast Ohio Medical University (NEOMED) among participants from the second year medical school class. Ten one-question quizzes created using Google Forms were announced over Twitter and email at the rate of one quiz per week. The first correct responder of each quiz chose a five-dollar coffee shop gift card, movie ticket, or a meeting with a NEOMED faculty person as their prize.

Results: An average of 23.8% of the second year medical student class at NEOMED participated per quiz. A total of 80 individuals (55.9%) submitted 340 responses during the competition.

Limitations: This is a single-center study with a limited sample size.

Conclusions and Relevance: This study presents a process evaluation for the use of online quiz competitions amongst medical students. Optional online quizzes with small incentives may foster motivational competition among medical students, increase online interactions with faculty, and serve as study material for exams.

Keywords: competition-based learning, medical student, education games, quizzes, training, dermatology teaching

Introduction

Attendance to medical school lectures have been decreasing nationwide, thus limiting interactions between preclinical students and faculty [1]. Furthermore, absenteeism amongst the medical student population has been shown to affect faculty members'

enthusiasm for teaching [2]. This can cause difficulty for institutions that are trying to attract, or retain, educators. Both the value of classroom attendance and the investigation of novel teaching methods to best make use of students' time have been heated topics in the literature [3].

Optional competitions allow students to address their personal knowledge gaps and prepare for exams [4]. Opponents of competition in education debate that it may increase student anxiety [5]. However, research has shown that organized competitions and online formative tests correlate with higher exam scores [4, 5]. Literature on the role of educational competitions in the graduate school population is lacking.

The role of web-based resources and social media in medical education has risen exponentially as illustrated by the vast number of apps and online modules available to healthcare professionals of all levels [6, 7]. Online resources are a way to engage students who prefer to not attend lectures of are not avid participators [8]. This study hoped to explore the methods of broadcasting quiz questions over Twitter and email to second year medical students. The aim of this study is to determine if creating healthy competition with small incentives can affect student participation.

Methods

Second year medical students at Northeast Ohio Medical University (NEOMED) were informed of the competition in person and invited to participate weekly in one-question quizzes via email and a public Twitter account created for this project (@Derm_CME). Students were also informed that data would be confidential with identifiers only used to contact competition winners. This study was approved by the NEOMED Institutional Review Board.

One quiz was administered weekly for 10 weeks. Emails contained answers to previous quizzes and explanation, along with the name of the previous winner if permission was granted to release each name and an encouraging message with the next quiz link. Quiz questions were designed specifically for this study and reflected high-yield dermatology principles combined with other course topics such as immunology and pharmacology. For the first quiz, a delay in time from when the quiz link was provided and when submission was open was in place in order to grant adequate time for students to read about the competition and follow the twitter account. For the rest of the quizzes, submissions were collected immediately. Submissions for each quiz were collected for 48 hours and the first student with the correct answer chose between a five dollar coffee shop gift card, movie ticket, or meeting with a NEOMED physician as their prize. Answers and brief explanations were tweeted at the conclusion of the submission periods. The survey platform used was Google Forms, a free resource that automatically collected respondents' email addresses and time-stamped each response. In the survey, students chose a multiple choice answer and declared their class, i.e. MS2. Photographs were sourced from texts available to NEOMED students and from personal (EM) collection.

The amount of participation was measured for each quiz, along with how many students participated overall. The chosen prizes were recorded (Figure, 1, 2 and 3).

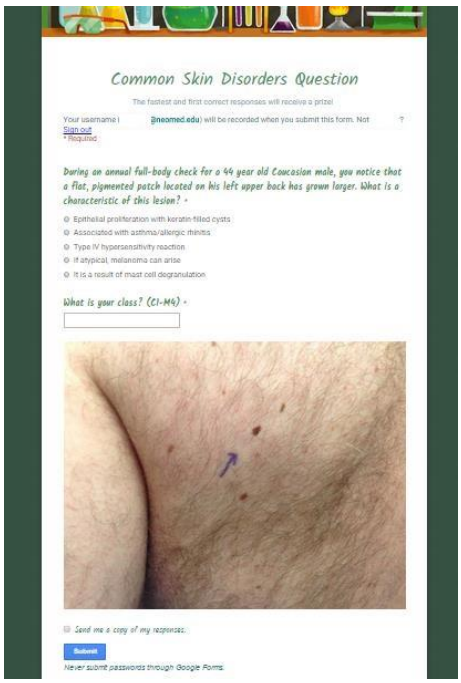


Figure 1. Example Question

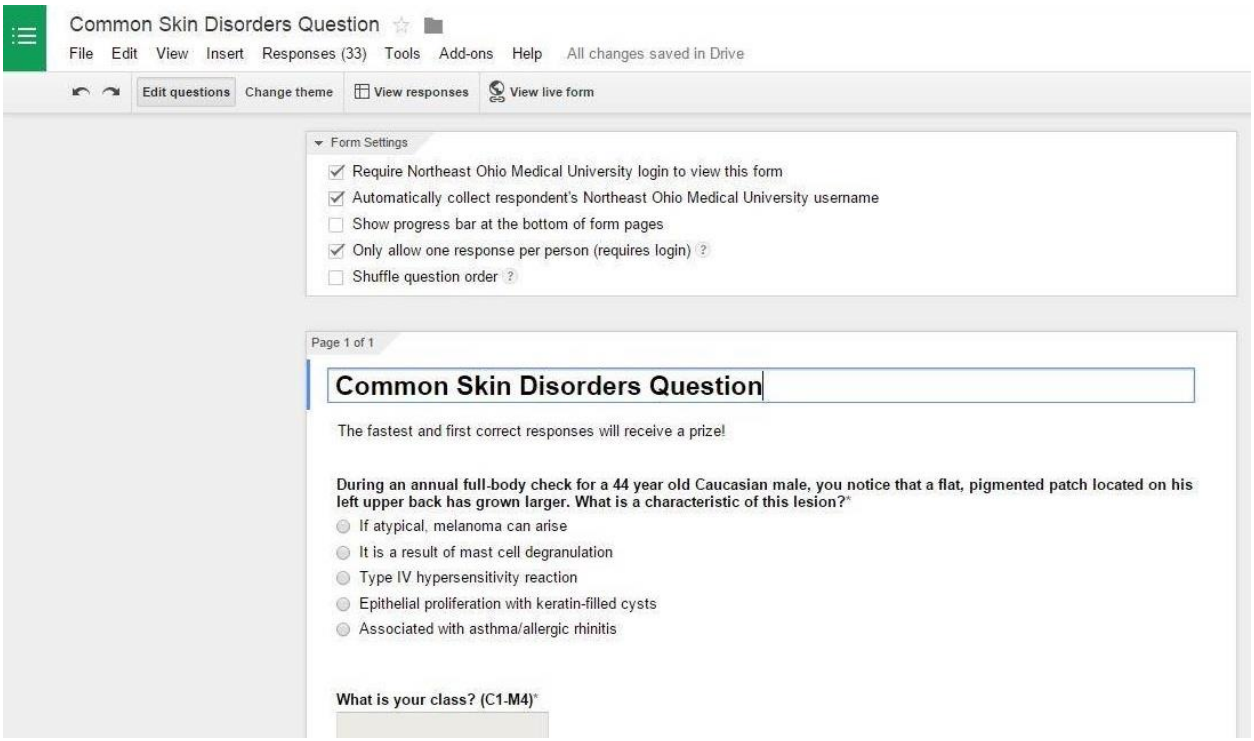
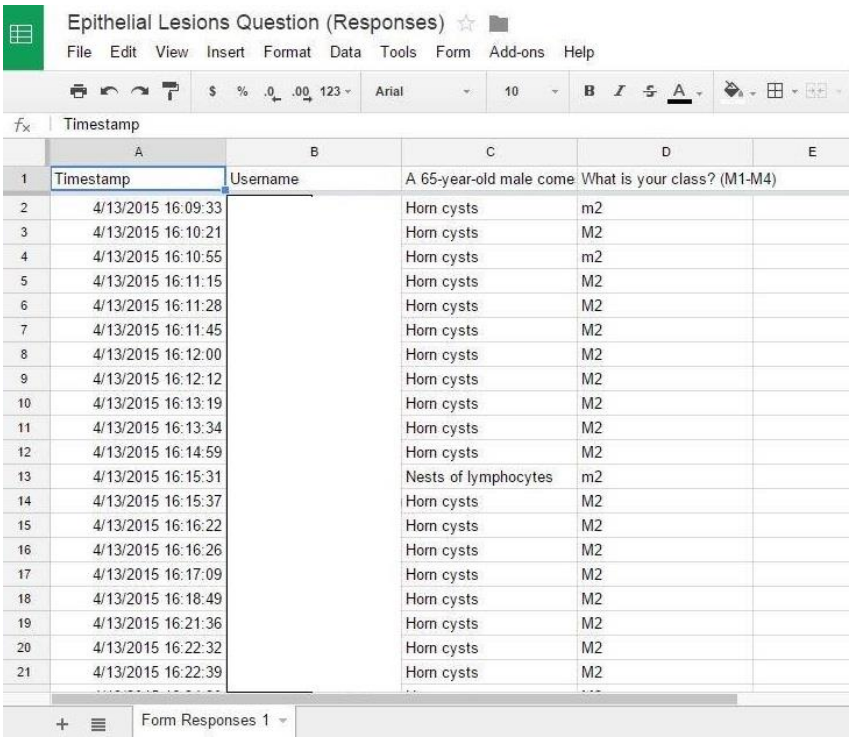


Figure 2. Google Forms Input



	A	B	C	D	E
1	Timestamp	Username	A 65-year-old male come	What is your class? (M1-M4)	
2	4/13/2015 16:09:33		Horn cysts	m2	
3	4/13/2015 16:10:21		Horn cysts	M2	
4	4/13/2015 16:10:55		Horn cysts	m2	
5	4/13/2015 16:11:15		Horn cysts	M2	
6	4/13/2015 16:11:28		Horn cysts	M2	
7	4/13/2015 16:11:45		Horn cysts	M2	
8	4/13/2015 16:12:00		Horn cysts	M2	
9	4/13/2015 16:12:12		Horn cysts	M2	
10	4/13/2015 16:13:19		Horn cysts	M2	
11	4/13/2015 16:13:34		Horn cysts	M2	
12	4/13/2015 16:14:59		Horn cysts	M2	
13	4/13/2015 16:15:31		Nests of lymphocytes	m2	
14	4/13/2015 16:15:37		Horn cysts	M2	
15	4/13/2015 16:16:22		Horn cysts	M2	
16	4/13/2015 16:16:26		Horn cysts	M2	
17	4/13/2015 16:17:09		Horn cysts	M2	
18	4/13/2015 16:18:49		Horn cysts	M2	
19	4/13/2015 16:21:36		Horn cysts	M2	
20	4/13/2015 16:22:32		Horn cysts	M2	
21	4/13/2015 16:22:39		Horn cysts	M2	

Figure 3. Google Forms Responses

Results

An average of 23.8% out of 143 potential medical students participated per quiz. Over the course of this study, 80 students participated, 55.9% of the class, and submitted a total of 340 responses. There was an average of 4 quizzes with a range of 1-10 quizzes submitted per participant.

The most participation occurred with the second quiz, 30.1%, whereas the lowest was with the first quiz, 5.6%. Eight out of 10 winners chose a coffee shop gift card as their prize, one chose to have breakfast with Dr. Mostow, and one chose the movie ticket. Percent correct answers for the quizzes ranged from 81-100% (Figure, 4, Table 1 and 2).

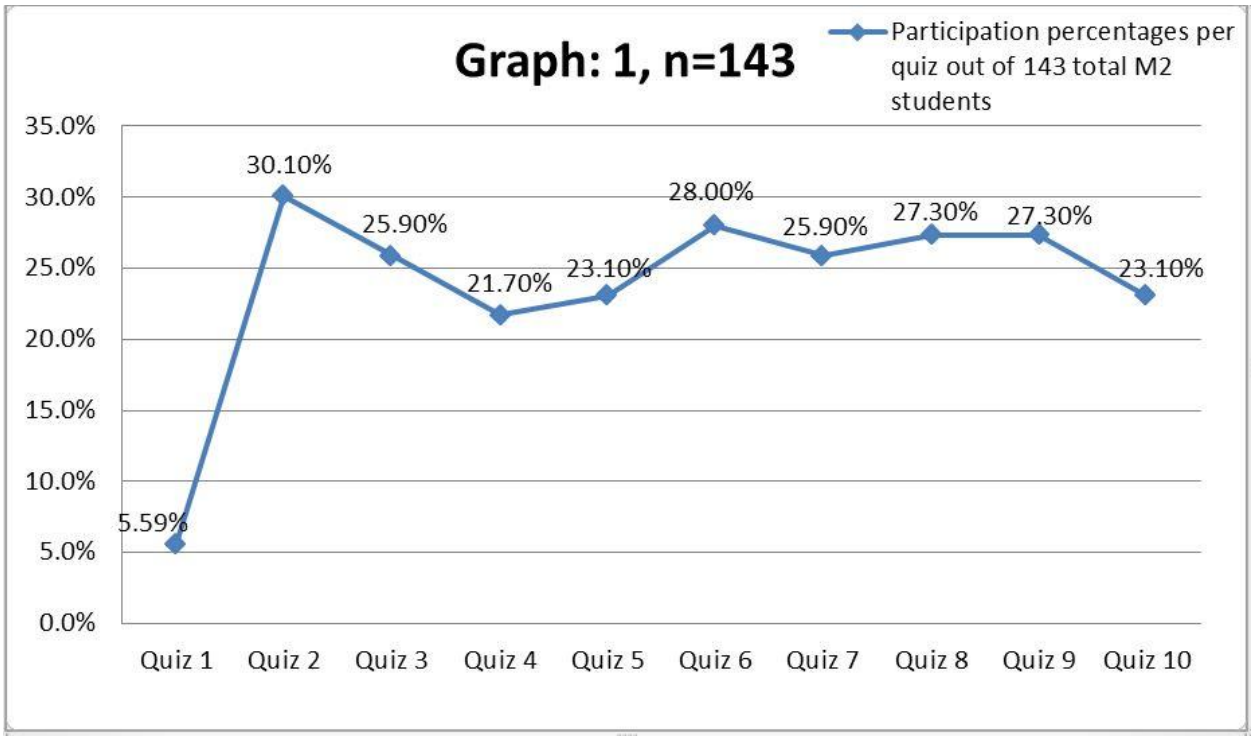


Figure 4. Participation Rates per Quiz out of 143 total Second Year Students

Table 1. Number of quizzes completed per student

Quizzes Completed	10-9	8-7	6-5	4-3	2-1
Number of Students	10	9	16	13	32

Table 2. Timing of responses and percent correctness

Quiz Number	Number of Participants	Percent Correct	Submissions in 1st 10 min of Responses	Submissions in 1st hour	Submissions Next Day
1	8	100%	0	0	2
2	43	95%	17	27	5
3	37	89%	10	16	5
4	31	81%	4	8	0
5	33	97%	10	19	0
6	40	95%	23	28	3
7	37	97%	13	21	4
8	39	100%	10	21	4

9	39	85%	19	30	2
10	33	91%	11	13	0

Discussion

This pilot study provides a model for incorporating competition aimed at increasing class participation into the medical school curriculum. Medical schools that do not have a large dermatology department such as NEOMED can utilize this model to provide more exposure to their students. Relating other class topics, such as microbiology and gastrointestinal diseases, to dermatology with critical thinking questions may increase interest in dermatology and prepare students for exams.

User-friendly survey platforms such as Google Forms limit the amount of steps students must take to access and complete online quizzes. The low participation rate on the first quiz, 5.6%, may relate to the delay between the times that students received the quiz link and when submission was open. This delay was unique to the first quiz and as mentioned in the results section, the highest participation rate was with the second quiz. Participation rates remained stable through the end of the competition. Therefore, ease of access to online quizzes should be kept in mind when designing online resources and competitions. The most popular prize choice amongst students was the coffee shop gift card. This may be due to the timing of the competition, which was towards the end of the academic year when second year students are preparing for the USMLE Step 1 board exam.

Optional quizzes with small incentives can motivate medical students to interact with faculty outside of the traditional classroom setting [9]. Social media is increasingly becoming an educational resource in today's medical school curriculums and platforms such as Twitter allow for open discussion in an informal setting. Electronic materials and the use of technology should be encouraged as supplements to traditional teaching methods [10].

The limitations of this study are that it was based at one center and the sample size was limited to second year medical students. Increased advertisement efforts, inclusion of alternative question topics, and the involvement of faculty members from additional medical specialties may improve participation rates. A study with a control group to compare the effects of online quizzes may shed more light on the various uses of competition and social media in the educational setting.

Efforts are underway to continue this project into the third year curriculum at NEOMED. Moreover, there are plans to move this project from a pilot study to a defined program to increase the ability to alter aspects of the competition without additional IRB review. By including students in the creation and growth of this project, opportunities will be provided for students to gain experience and learn more about the field of dermatology. Assimilating this project into the curriculum will increase interactions between faculty and students and complement the resources that students use to prepare for exams. Increasing online interaction between students and faculty may circumvent the obstacles that have arisen due to absenteeism.

Conclusions and Relevance

This study presents a process evaluation for the use of online quiz competitions amongst medical students. Optional online quizzes with small incentives may foster motivational competition among medical students, increase online interactions with faculty, and serve as study material for exams.

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