What Can SCORE Web Portal Usage Analytics Tell Us About How Surgical Residents Learn?

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PURPOSE: The Surgical Council on Resident Education (SCORE) was established in 2004 with 2 goals: to develop a standardized, competency-based curriculum for general surgery residency training; and to develop a web portal to deliver this content. By 2012, 96% of general surgery residency programs subscribed to the SCORE web portal. Surgical educators have previously described the myriad ways they have incorporated SCORE into their curricula. The aim of this study was to analyze user data to describe how and when residents use SCORE.

METHODS: Using analytic software, we measured SCORE usage from July, 2013 to June, 2016. Data such as IP addresses, geo-tagging coordinates, and operating system platforms were collected. The primary outcome was the median duration of SCORE use. Secondary outcomes were the time of day and the operating system used when accessing SCORE. Descriptive statistics were performed, and a $p < 0.05$ was deemed statistically significant.

RESULTS: There were 42,743 total SCORE subscribers during the study period (75% resident and 25% faculty) with a mean of 14,248 subscribers per year. The overall median duration of SCORE use was 11.9 minute/session (interquartile range [IQR]: 6.8). Additionally, there was a significant increase in session length over the 3 academic years; 10.1 (IQR: 6.4), 11.9 (IQR: 7.2), and 13.2 minute/session (IQR: 5.4) in 2013 to 2014, 2014 to 2015, and 2015 to 2016, respectively ($p < 0.001$). SCORE usage was highest in November to February at 21.0 minute/session (14.2) compared to July to October and March to June (12.3 [IQR: 3.2] and 9.6 minute/session [IQR: 2.2]), respectively ($p < 0.001$). This seasonal trend continued for all 3 years. We observed an increased number of sessions per day over the 3 years: median of 1500 sessions/d (IQR: 1115) vs 1706 (IQR: 1334) vs 1728 (IQR: 1352), $p < 0.001$. (Fig.). Most SCORE sessions occurred at night: 38,011 (IQR: 4532) vs 17,529 (IQR: 19,850) during the day ($p < 0.001$). Windows was the most frequently used operating system at 48.9% ($p < 0.001$ vs others).

CONCLUSIONS: SCORE usage has increased significantly over the last 3 years, when measured by number of sessions per day and length of time per session. There are predictable daily, diurnal, and seasonal variations in SCORE usage. The annual in-training examination is a prominent factor stimulating SCORE usage. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: surgery residents, study habits, ABSITE, SCORE

COMPETENCIES: Medical Knowledge, Practice based Learning and Improvement, Professionalism

INTRODUCTION

The Surgical Council on Resident Education (SCORE) was established in 2004 by a consortium of surgical organizations: the American Board of Surgery (ABS), American College of Surgeons, American Surgical Association, Association of Program Directors in Surgery, Association for Surgical Education, Accreditation Council for Graduate Medical Education (ACGME), and Society of American Gastrointestinal and Endoscopic Surgeons.[1] SCORE developed a comprehensive, competency-based curriculum for general surgery residency training available through an

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online portal.[2] Currently, 97% of the 272 ACGME-accredited general surgery residency training programs subscribe to SCORE. The SCORE web portal was launched in 2009 as a learning management system for general surgery residency programs and their trainees to use as a resource for study and education. The content in SCORE is organized around 750 discrete modules, which contain learning objectives, study questions, text and multimedia resources, and self-assessment questions.

Since 2015, the SCORE web portal has provided an additional organizational framework whereby users and programs can cycle through the entire SCORE content in a defined 2-year curriculum. This sequence, This Week in SCORE (TWIS), includes a cluster of related modules paired with 10 peer-reviewed self-assessment questions to aid in preparation for each week's educational content. Trainees and programs are able to track their performance on these weekly quizzes. TWIS is also used by many programs as the basis for didactic conferences.

Investigators have previously studied correlations between in-training examinations and board certification.[3-5] Chang et al.[6] examined the sources used by residents. Prior work has demonstrated a considerable improvement in mean ABS qualifying examination scaled scores for residents in programs that initially subscribed to the SCORE web portal.[7]

The purpose of this report was to analyze SCORE portal usage data to determine how residents study on a daily and weekly basis and if patterns change during the academic year.

METHODS

We used Google Analytics (Mountain View, CA) to measure SCORE portal use from July, 2013 to June, 2016. Once a user has logged onto the SCORE portal, that user's internet protocol (IP) address can generate an approximate geographic location. Data such as geo-tagging coordinates, session length, and operating system platforms were collected, in concordance with each user's terms of service agreement that allows the collection of "aggregated, anonymous statistical information about use of the portal by licensees." IP addresses were not linked with individual users. The primary outcome was the median duration of SCORE portal use as measured by logged-in time. Secondary outcomes were the time of day for logins and the operating system used for access. Descriptive statistics were performed, and a $p < 0.05$ was deemed statistically significant.

RESULTS

There were 42,743 individual subscribers to the SCORE website during the 3-year study period. Subscribers comprised 75% resident and 25% faculty, with a mean of 14,248 subscribers per year from and a mean of 433 residency programs per year. IP address tagging indicated that subscribers overwhelmingly resided in the United States. There were, however, subscribers from every inhabited continent (Fig. 1).

The overall median duration of SCORE use was 11.9 minute/session (interquartile range [IQR]: 6.8). Additionally, there was a significant increase in session duration over the 3 academic years; 10.1 (IQR: 6.4), 11.9 (IQR: 7.2), and 13.2 minute/session (IQR: 5.4) in 2013 to 2014, 2014 to 2015, and 2015 to 2016, respectively ($p < 0.001$). SCORE portal usage was highest from November to February at 21.0 minute/session (14.2) compared to July
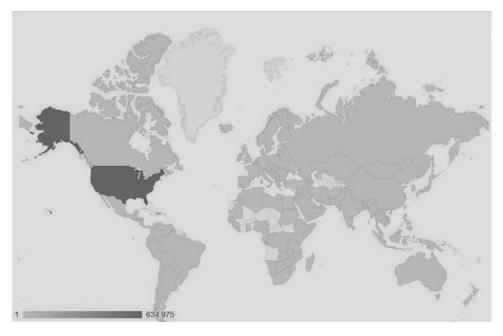

FIGURE 1. Countries where the SCORE portal was accessed from 2013 to 2016.