

SESSION INFORMATION

Submission ID#: 551928132

Topic Category: Healthcare App and Tech Enabling Care Delivery

Sub-Topic: Standards, challenges, and opportunities related to the use of healthcare applications.

Content Stream: Technology

Format/Level: 60 Minute Lecture/Intermediate

Audience Professional Roles: IT Professional / Research and Development Professional / Quality Professional

Global Audience: Yes

Region/Country Specific: No

If so, list region/country:

CONTENT DETAILS

Session Title: Modifying the MARS to Evaluate Specific Health Applications

Brief Description: With the explosion of today's mobile application marketplace, there exists a need to better differentiate between the quality of available applications. Specifically, mobile health applications (applications that help either the disabled or are used in a healthcare setting) lack a common rating scale that is neither subjective nor biased. By utilizing the Mobile Application Rating Scale (MARS) and its ability to be customized in a modular fashion for a special population, a quantitative-based scoring system was implemented to better evaluate mobile applications designed for the deaf and hard-of-hearing. Furthermore, a content expert was recruited to refine our custom criteria as well as provide insight into the hard-of-hearing population's desires for specific features in mobile applications.

Learning Objectives:

- Design content-specific criteria to evaluate mobile health applications
- Identify and engage an appropriate content expert
- Identify population-specific needs and implement criteria into rating scale

Describe the TOPIC/ISSUE that will be presented and how it was identified.

In the United States, there are more than 40 million individuals over the age of 18 that are considered "hearing impaired." Of these, more than 1 million Americans are "functionally deaf," meaning having difficulty in hearing normal conversation, even with the use of a hearing aid [Vital and Health Statistics 2012; 260:1-161]. With the rapid proliferation of mobile health applications in recent years, the usage of mobile applications for bodily health and mental well-being has increased [Transl Behav Med. 2011; 1:53-71]. Many hard-of-hearing persons benefit from mobile applications that allow them to better interface with loved ones, friends, and ultimately strive towards a more complete societal integration: these applications include American Sign Language translators, hard-of-hearing assistants, and speech-to-text applications. However, after a literature review in January of 2018, it was apparent that these applications lacked a definitive and non-subjective rating scale (beyond the common "star" rating) to determine their quality. It was decided that a standardized scale would be necessary to quantitatively rate these applications. While the HIMSS has compiled guidelines for evaluating the usability of mobile health applications, several sectors such as the "appropriateness" of the application's information were not defined well enough to target a specific population [mHIMSS; 2012]. The Mobile Application Rating Scale (MARS) was developed in 2015 to implement a standardized rating scale for category or population based mobile applications that contain content-specific requirements [JMIR mHealth and uHealth 2015; 3:1]. With the assistance of a content expert, it became apparent that the MARS would require additional scoring criteria to accurately and fairly rate hard-of-hearing compatible applications due to the specific needs and desires of the hard-of-hearing. Because of the MARS's modularity, it was possible to create four additional criteria that were verified to better differentiate between the quality of these applications, as would be rated by a person from within the target population. In this, an approach was created and a template was designed to rank these mobile health applications in a standardized manner that is repeatable and transparent.

Please describe the APPROACH(ES) used to address the topic/issue.

In January of 2018, a preliminary literature review was conducted to determine presence of literature related to the quality of hard-of-hearing mobile health applications on the marketplace. After a lack of literature was found, the necessity for a standardized rating scale was apparent: the Mobile Application Rating Scale (MARS) was selected because of its compatibility, scoring categories, reliability, and modularity. After the decision to use the MARS, four additional criteria were added to the MARS's "subjective quality" section to better differentiate between the quality of hard-of-hearing applications. After the scale was completed, a content expert was recruited to verify and refine our criteria, as well as to provide insight into the target population's (hard-of-hearing) desires for specific

features in the applications. After a master list of applications to be rated was generated, these applications were split into three categories: "ASL translators," "hard-of-hearing assistants," and "speech-to-text." Additionally, an inter-rater reliability test was conducted to ensure the reliability of quantitative scores across raters. Finally, the raters sorted through the master list of applications, assigning a composite score to each application, and ranking them accordingly.

Please describe the CHALLENGES/BARRIERS faced.

The primary challenges faced while developing a standardized scale for hard-of-hearing applications were the poor quality of certain applications affecting our inter-rater reliability, and the lack of documentation as to the location of certain applications and features within applications. While the initial purpose of our project was to determine the quality of available hard-of-hearing applications, some of the applications initially selected were of such a poor quality that our inter-rater reliability was affected by a lack of information from these applications. Additionally, many of these applications (even in the primary marketplaces) featured poor developer and feature documentation, along with a less than reliable update history to ensure current features. One challenge that was encountered during every step of the study's design was the need for transparency and repeatability. Part of the end goal of the study was to produce a template that could be used to rate other fields of mobile health applications, this created additional difficulty in detailing the process.

Please describe the CONCLUSION/OUTCOMES ACHIEVED.

Based on the criteria set in place, we identified the top ten applications in our list based off of composite scores. Furthermore, the highest-rated application in each of our three categories was identified. While there was a significant amount of conclusions made about the actual quality of available hard-of-hearing applications, the study also produced a standardized model for evaluating applications pertaining to the deaf and hard-of-hearing population that provided a measure of quality beyond subjective rating or the "star" system. Furthermore, the study was submitted to peer review journals for evaluation. Through the use of the modified Mobile Application Rating Scale (MARS), hard-of-hearing applications of the future can be evaluated for their quality in a standardized manner. Our team identified a very robust evaluation tool (MARS) that others could use for their evaluation process. This presentation will share our methodology used while designing the subjective section of the MARS along with additional documentation that others can use to evaluate specific health applications.

Please describe the RECOMMENDATION(S) you would offer.

It is recommended that our approach to modifying an already standardized rating scale be used in the realms of other types of applications, such as other mHealth applications, fitness and wellness applications, and personal health assistant applications. Furthermore, it is recommended that developers, providers, and users consider the MARS as a standardized rating scale for mHealth applications that can be used to determine the quality of these applications. Finally, additional research may be desirable with the usage of an application's target population as raters.

SPEAKER DETAILS

Speaker Role: Primary Speaker

Name: Ryan Romero

Title/Org/City/State/Country: Student, University of Florida, Bradenton, FL, USA

Worksite: Academic Education Institution

Time in Field: 1 - 5 years

Speaker at HIMSS18: No

If so, Venue:

Speaker at Past HIMSS Conferences: 0

Bio: Ryan L. Romero is a Master's of Public Health candidate in the Combined Bachelor's and Master's of Public Health at the University of Florida's College of Public Health and Health Professions. Mr. Romero received an Associate of the Arts degree at the State College of Florida in 2016 before pursuing Public Health at the University of Florida. Mr. Romero has various research interests in the fields of healthcare technology and applications, special and disabled populations, and the psycho-social aspects of disability. Additionally, he has led academic discussions about the value of interdisciplinary collaboration and interdepartmental interoperability in the healthcare setting. Ryan L. Romero is a Master's of Public Health candidate in the Combined Bachelor's and Master's of Public Health at the University of Florida's College of Public Health and Health Professions. Mr. Romero received an Associate of the Arts degree at the State College of Florida in 2016 before pursuing Public Health at the University of Florida. Mr. Romero has various research interests in the fields of healthcare technology and applications, special and disabled populations, and the psycho-social aspects of disability. Additionally, he has led academic discussions about the value of interdisciplinary collaboration and interdepartmental interoperability in the healthcare setting.

Past Speaking Experience: Graduated from academic public speaking class. Led lengthy seminar discussions related to Public Health as a campus organization officer. Led discussions and designed advertisements related to the importance of interdisciplinary collaboration and interdepartmental interoperability in the healthcare setting.

Speaker Role: Co-Speaker 1

Name: Rick Kates III

Title/Org/City/State/Country: Clinical Assistant Professor, University of Florida, Gainesville, FL, USA

Worksite: Academic Education Institution

Time in Field: 6 - 10 years

Speaker at HIMSS18: No

If so, Venue:

Speaker at Past HIMSS Conferences: 0

Bio: Frederick R. Kates III, MBA, PhD, serves as a Clinical Assistant Professor for Health Services Research, Management and Policy Department in the College of Public Health and Health at the University of Florida. Rick received his doctoral degree in Health Services Policy & Management from the University of South Carolina. Dr. Kates has various research interests related to health policy most recently the evaluation outcome-based evaluation of service quality in Accountable Care Organizations (ACOs) and the impact of the Medicaid expansion. Dr. Kates has been recognized by the South Carolina Public Health Association with the J. Michael Suber Media Excellence Award for sharing best pedagogical practices and online course development strategies, the UF Clinical and Translational Science Institute Educator Award, and accepted to the UF Entrepreneurship Faculty Fellows. Prior to this position, he was an Instructional technology coach and instructor for Beaufort County Schools in South Carolina. Involved with the integration of over 8000 iPads into classrooms, instructional design and software integration. Concurrently he taught managerial and financial accounting for Park University on the Marine Corps Air Station. Before becoming an educator, he was the Purchasing Manager for Eaton's Electrical Engineering Services and Systems Division. He was part of the part of the division's initial startup with responsibility for \$60 million in capital expenditures and facility build out. He negotiated the division's national agreements with suppliers, developed the national calibration program for the electrical testing equipment and the freight payment system, and was the project manager for the roll out of Oracle Projects and Purchasing software modules. Dr. Kates has also served in the United States Army, with active duty service patrolling the Demilitarized Zone (DMZ) in Korea.

Past Speaking Experience: "Infographics: Filter Information, Establish Patterns, and Present More Meaningful Information" presented at the AUPHA Annual Meeting, Philadelphia, Pennsylvania, June 14, 2018, "Power of 3 Discussion Starter Technique (P3DST) with a Sandwich Critique" presented at the AUPHA Undergraduate Workshop, Orlando, Florida, October 5, 2017, "Utilization of Interactive Trading Platforms to Increase Competencies within Healthcare Finance" presented at the AUPHA Undergraduate Workshop, Orlando, Florida, October 5, 2017, "Developing Warning Label Strategies for Waterpipe Tobacco Smoking Products" presented at the Scientific Retreat on Tobacco-Related Research, Medical University of South Carolina, Charleston, SC, October 30, 2014, "Geographical Proximity of Waterpipe Tobacco Smoking Establishments to Colleges and Universities in the United States" presented at , The 2nd International Conference on Waterpipe Smoking Research, Doha, Qatar, October 22, 2014, "Waterpipe Tobacco Smoking in the United States: Findings from the National Adult Tobacco Survey" presented at The 2nd International Conference on Waterpipe Smoking Research, Doha, Qatar, October 22, 2014, "Proximity Analysis" presented at the USC Tobacco Research Group, Columbia, SC, October, 2014, "NATS, GIS, and Google Trends". Presented at the SC TRIG – Medical University of South Carolina, Charleston, SC, August 14, 2014