Rural Information Connection: An iPad Mini Lending Program to Rural Student Physicians

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Background

Rural environments often have limited access to funding and resources, and often articulate the need for access to point-of-care health information resources to quickly answer clinical questions [1-2]. For medical students entering that environment, it is essential to have access to clinical information tools to achieve educational and clinical care objectives during physician training. Mobile devices and health information apps provided an opportunity to support this population [3-4].

The Rural Information Connection project aimed to promote awareness and access to high-quality mobile health apps to medical students enrolled in the Rural Student Physician Program (RSPP). The UIC Library of the Health Sciences – Peoria obtained iPad Mini 3s to loan students during their seven-month clerkship. The iPad Minis were pre-loaded with apps to support the educational and clinical goals of the rural student physician longitudinal integrated curriculum (LIC) rotation. Students attended one 60-minute orientation where they reviewed resources available on the iPad Mini and created accounts for accessing subscription resources prior to rotating out to the rural community sites.

Research Questions

1. Did the RSPP students report their use of iPad Minis for learning and clinical decision support?
2. What apps or resources did the students use during a rural longitudinal integrated clerkship?
3. Did the students report that usage of the iPad Mini and health information apps enhanced their rural clerkship experience?

Research Methodology

A mixed methodology for evaluation was used to analyze the effectiveness of the program. A comparison of pre- and post-surveys and thematic coding of the structured learning journal (SLJ) prompts was conducted.

Hard-copy pre- and post-surveys were implemented at the beginning and end of the rotation. This was used to determine the students' knowledge of the technology prior to the rotation. The seven-point validated Technology Acceptance Model (TAM) instrument was modified for the iPad Technology and incorporated into the post-survey to find out the adoption of the iPad technology into their workflow [5].

qualtrics

Using the survey tool, Qualtrics, the students were asked to participate in eight SLJ prompts sent during their rural placement. The SLJ prompts requested that students record brief experiences in which the iPad was used as well as documenting apps and resource use.

Thematic level-one coding was carried out by two reviewers identifying resource use, task performance, and participant reflection within the SLJs.

Results for Question 1: iPad Mini Reported Use

Fig 1: iPad Mini Use

Yes - 7   No - 0

Fig 2: Frequency of Use

Daily - 5
Couple Days a Week - 1
Monthly - 1

Fig 3: iPad Mini Activities During Clerkship

Pre-Survey Anticipated Use   Post-Survey Reported Use

Results for Question 2: Resource Reported Use

Participants' Reported Resource Use via SLJs

Participants' Task Responses via SLJs

"[I use] Google Drive to track patient encounters"

"Constantly look up terms and diagnoses on UpToDate as well as drug information on the Drugs.com app"

"[I] use the USMLE_uWorld to do questions when I have a break during clinic or lunch hours"

"[I use] DynaMed to look up some history and physical things when I am preparing to talk to a patient"

Results for Question 3: Activity Enhancement by Using iPad Mini & Resources

"Using a tablet has been very beneficial to me out in my community rotation. I am able to access research articles and protocols quicker than if I had to sit down with a desk top computer. I felt that using DynaMed, UpToDate, and some of the pharmacy drug references contributed to my care of my patients in clinic and the hospital"

"Similar to using a smart phone, but much more user friendly for reading longer articles/ data sheets"

"I can use the same applications found on the iPad on my iPhone. The use of the iPad thus becomes redundant"

"[Patients] are very receptive when we attempt to look up information/clarification on the device"

Participants' Reflection Responses via SLJs

Table 1: Technology Acceptance Model [5] Mean Post-Test Scores	
TAM 7-Point Scale	**Mean**
Using the iPad in my work helps me to accomplish tasks more quickly	5.28
Using the iPad improves my work performance	4.85
Using the iPad increases my work productivity	4.71
Using the iPad enhances my effectiveness at work	5.28
Using the iPad makes it easier to do my work	5.14
I find the iPad useful in my work	5.28
Learning to operate the iPad has been easy for me	6.85
I find it easy to get the iPad to do what I want it to do	6.71
My interaction with the iPad is clear and understandable	6.57
I find the iPad to be flexible to interact with	6.42
It is easy for me to become skillful at using the iPad	6.42
I find the iPad easy to use	6.71
I use my iPad very frequently (many times per week)	6
I use my iPad for a variety of purposes (clinical notes, reports, medical info, etc.)	5.71

Results

Analysis included seven students from the RSPP program at the University of Illinois College of Medicine at Peoria who completed their rural rotation from July 2015 to January 2017.

Analysis Includes:
- Pre-Surveys - 5
- Post-Surveys - 7
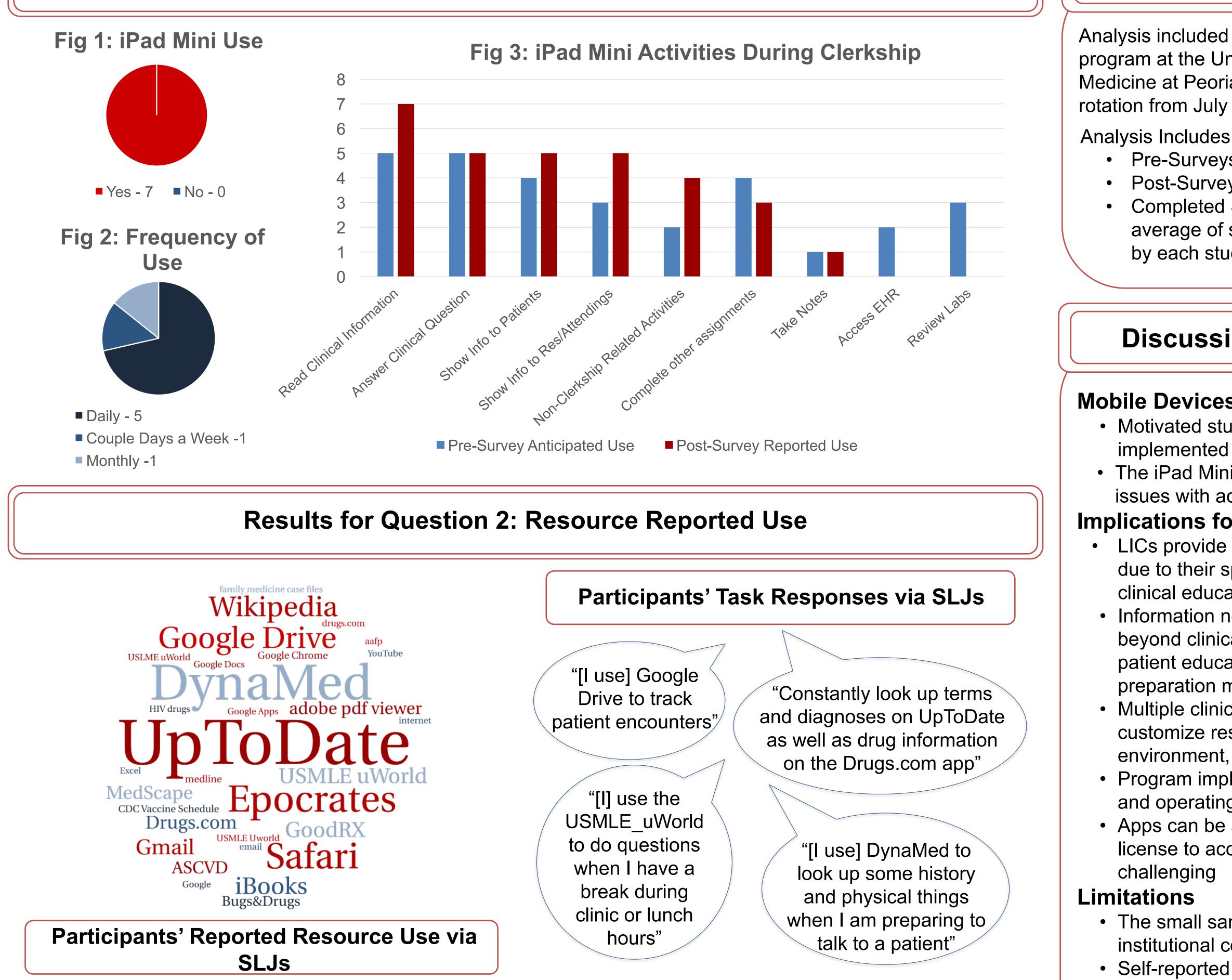- Completed SLJs - 49, with an average of seven completed by each student

Discussion

Mobile Devices in Rural LICs
- Motivated students explored the technology and implemented it in clinical and learning activities
- The iPad Mini was dependent on WiFi causing issues with access to resources

Implications for Librarians
- LICs provide a unique audience to partner with due to their special information needs during clinical education
- Information needs during rotation extended beyond clinical content to include apps for patient education, communication, and test preparation materials
- Multiple clinical sites made it challenging to customize resources to that student's environment, especially with EHR access
- Program implementation was time-consuming and operating system dependent
- Apps can be a one-time purchase or a yearly license to access content, making purchases challenging

Limitations
- The small sample size represents a small institutional cohort/ No control group
- Self-reported behavior may not be representative of practice or use
- Delay in IRB exemption approval prevented all data from being used in analysis

Future Directions
- Further interpretation of data will be pursued through pattern coding
- With the positive student feedback, the Clerkship Director wishes to continue the iPad Mini lending program in 2017/2018

Conclusion

The assessment informed the researchers by showing the information-seeking behavior in a rural environment and acceptance of new technology into the participants' workflow.

With use of the iPad Minis and resources, the students were able to access essential clinical information, patient education sources, and test prep material, adding to their educational experience within their rural student physician training.

References
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6. Image citation - Apple iPad mini 3 by Chris F / CC BY-SA 2.0