THE USE OF MOBILE COMPUTING DEVICES IN ANESTHESIA RESIDENT EDUCATION: A CROSS-SECTIONAL SURVEY STUDY

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Introduction: Recently, there has been an increased interest in integrating mobile computing devices, such as the iPad, into medical education. Five months ago, the Stanford Anesthesia residency program provided mobile computing devices (iPad 3, Apple, Cupertino, CA) to 63 of our residents for the duration of their residency. A cross-sectional survey study was conducted in order to understand how these residents are using mobile computing devices for anesthesia education. Specifically, we sought to understand how often the residents were using the mobile computing devices, in what ways they were using the devices, and how this has impacted their anesthesia residency training.


Survey Design: After testing for reproducibility and clarity, we deployed our survey to our 63 anesthesia residents. The survey asked the residents questions about how they used the iPad for studying and residency tasks.

The survey included 9 open-ended questions, and 17 multiple-choice questions. We organized the questionnaire into three general domains:

- General Information: We collected demographic information from the students such as gender, age, and previous experience with mobile technology.
- iPad Usage: We collected information about when the residents were using the iPads, and the impact on their desktop computer use.
- iPad Applications: We collected information about individual applications that we preloaded onto the iPad.

**Data Analysis:** After we received our results, we analyzed them using a mixed-method. The open-ended collected data was entered into NVivo 10 and the questions were analyzed using qualitative methods.

**Results:** 90.2% of Stanford Anesthesia Residents agree or strongly agree that an iPad would enhance their ability to learn anesthesia. 85.7% of residents surveyed also agreed or strongly agreed that iPads were under-utilized in anesthesia education.

After receiving the iPad, 64.3% of our residents said that they were using their personal desktop computer less. When asked what frequency the residents used their iPad, 46.4% used them daily, 39.3% used them every other day, and the remaining 14.3% used them once a week.

The two main activities that the residents used the iPads for most frequently are e-mail and reading medical books or papers. The places that the residents are using the iPad most often are at home, followed by inside the OR, and then inside coffee places. The main reason stated for using it at home was because the iPad was too bulky to carry with them at all times.

We also asked the residents how useful the iPad provided by Stanford was for specific activities. 85.7% of residents said that the iPads were useful or very useful for accessing medical papers and 95% said that the iPads were useful or very useful for studying. 71.4% thought the iPads were useful or very useful for clinical issues.

Out of the individual applications that we provided to the residents, the applications rated most useful were the books and journals. One of our residents stated: "[the iPad] has revolutionized access to texts and primary literature for studying and preparing every day."

**Conclusions:** We found that a majority of our residents reported that the iPad is underutilized in medical education. Our survey has shown us that when given iPads, the majority of our residents use their iPads almost daily, and that the iPads have been reported to be useful for studying and accessing medical books and journals. The residents have also reported that they are reading more, chiefly because the iPad is an excellent resource for studying at home and outside of the operating room clinical environment.

However, the residents did voice concerns that they would lose the iPad because of its small size and inability to securely store the device in the clinical environment. Some residents also reported that the iPads were too bulky to carry around in the operating room. Future work in exploring the use of mobile computing devices may focus on implementation of the iPad Mini as a more portable option for in anesthesia medical education.