Medical Translation App Improves Communications Between Physicians/Medical Students and Patients

THE BACKGROUND:

A Linguistically Divided Country

Botswana, located in southern Africa, has several large cities including its capital, Gaborone (approximate population 232,000), and Francistown (approximate population 99,000). But most of its 2 million-plus inhabitants live in rural, desert areas with limited access to healthcare.

When healthcare providers would travel to these outlying areas, they often experienced another hurdle: a language barrier. While English is the official language of Botswana—and the language used to teach students at the University of Botswana School of Medicine—the native language of Setswana is spoken by nearly 79% of the population. That makes it very difficult for healthcare providers to interact with the majority of their patients.

The Botswana HIV/AIDS epidemic called attention to the problems faced by its healthcare providers. And in 2001, The University of Pennsylvania (UPenn) partnered with the government of Botswana and the University of Botswana (UB) to form the Botswana-UPenn Partnership (BUP). Its mission was to increase healthcare access and education to the population of Botswana and to develop an outstanding post-graduate training program at the University of Botswana.

THE CHALLENGE:

Breaking through the Language Barrier

UPenn medical students and doctors regularly rotate in Botswana for a global health rotation. The traditional solution to the language issue was to have interpreters work alongside healthcare providers, relaying information from provider to patient and vice versa. But that wasn't always possible or practical.

The language barrier was not confined to UB staff and students and those affiliated with BUP. "The majority of existing doctors in the country are expats from the U.S., Europe, Cuba and other African countries who are not fluent in Setswana," said Ryan Littman-Quinn, Director of Mobile Health Informatics at BUP.

Often healthcare providers had to administer to patients without knowing their medical history. And patients and their families had to guess what healthcare providers were trying to relay to them about

providing at-home care, symptoms to look for and how to administer medications. When a person or family member is ill, emotions run high. It's a confusing time under the best of circumstances, but the language barrier created a situation rife with misunderstandings. And when it comes to healthcare, misunderstandings can be life threatening.

THE SOLUTION:
Using the Functionality of DuoChart's Medical Translation App

That was the environment Littman-Quinn found himself in when he arrived in Botswana in October 2010. As Mobile Telemedicine Programs Manager for the BUP at the time, part of his focus was to launch a telementoring pilot project using smartphones loaded with customized medical apps. The idea was that the medical apps would connect University of Botswana medical residents and faculty to medical information and provide a digital platform for clinical mentorship. The goal of the pilot was to measure how they used the phones and make improvements before rolling it out to all UB medical students.

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While working on the pilot project, Littman-Quinn saw a tweet about Duo-Chart's Spanish medical app. The app, which helps medical providers bridge the language gap between Hispanic patients and English healthcare providers, was created by DuoChart for use in Texas hospitals and clinics.

The Spanish app provides translations (both written and spoken) for the most common medical terms and phrases. Touch the culturally sensitive images of the male and female anatomy on the screen and an audio recording provides the correct pronunciation of that particular body part. In addition, the search function allows users to quickly look up words, and clinical terms are organized into subsections, which are expandable for more in-depth information.

It was one of those "aha" moments for Littman-Quinn. "I stumbled onto the Spanish app and thought it would be a fantastic addition to our line of medical app resources," he said.

Partnering with DuoChart

Littman-Quinn contacted Indianapolis-based DuoChart to see if the company would be interested in collaborating with BUP's telementoring pilot project and develop a Setswana app.

Carmen Hansen Rivera, the designer and developer of DuoChart's Spanish app, has a background in migrant health and had long been a proponent of multicultural bilingual initiatives. She was well aware of the miscommunication problems between healthcare providers and patients of another culture and language, and agreed to assist.

> *"It's a handy, interactive translation tool that one can reference at all times regardless of Internet connectivity."*

It took a while—nothing moves quickly in Africa—but Littman-Quinn finally received the buy-in and funding to pursue the project with DuoChart. The core development team consisted of three UB students, two UPenn students and the head of the UB Linguistics Department who provided quality assurance for the translations. It took the team about seven weeks to develop and record all the necessary translations and another couple months for DuoChart to create the app and tweak it to everyone's satisfaction.

"Carmen was very easy to work with," Littman-Quinn said. "She was responsive to our concerns and communications and willing to work with us to determine the best solutions. The development process was a dream compared to my experiences developing other mobile applications."

Putting the Setswana app into practice

The Setswana app has been incorporated into BUP's mobile health service in several ways. Currently it's pre-installed on mLearning devices as well as on devices in other mHealth projects, and it's used by approximately 320 students. The app is also featured in training sessions.

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UPenn students who want a better grasp of the Setswana language use the app in combination with a translator, while their UB counterparts use the app to brush up on specific Setswana terms and phrases. And Littman-Quinn has been told that the app is used during morning report and ward rounds at the hospital by both students and expats.

"It's a handy, interactive translation tool that one can reference at all times regardless of Internet connectivity," Littman-Quinn said. "It's great for facilitating cross-cultural communications and also as a reference tool."

RESULTS:

Moving Forward

"Communication has certainly improved between the young Botswana medical students and their patients, as well as the expat doctors and their patients," Littman-Quinn said. "Simply providing key words and phrases has been helpful."

The app proved to be so useful it was offered as a free download by the BUP. To date, several thousand DuoChart Setswana apps have been downloaded world-wide.

While DuoChart's app has assisted communication and education between Setswana- and English-speaking people, the need doesn't stop there. Dineo Ketshogileng, senior librarian, Faculty of Health Sciences at the University of

Botswana, noted that Chinese physicians in Botswana are struggling with both the local language and the English language. "This is a potential for DuoChart to hold workshops for all foreign doctors," she said.

ABOUT UPENN:

The University of Pennsylvania is one of eight Ivy League universities in the United States. Founded in 1751 by Benjamin Franklin, Penn is recognized as American's first university and is home to the nation's first medical school (Perelman School of Medicine at the University of Pennsylvania), teaching hospital (Pennsylvania Hospital), and business school (the Wharton School).

Located in Philadelphia, the university's name is abbreviated to "Penn." In Botswana it goes by "UPenn" to clarify that it is the University of Pennsylvania and not Penn State.

ABOUT DUOCHART:

DuoChart is an Indianapolis, Indiana-based company founded by Carmen Hansen Rivera, whose work in migrant health led to the inclusion of multicultural bilingual initiatives in federally funded community health centers and Head Start programs. DuoChart specializes in translation materials that pair audio language with culturally sensitive imaging. In 2007 the company launched DuoCharts, its original printed product offering. Today DuoCharts are used in hospitals, emergency rooms, primary care clinics, universities, community colleges, nursing programs, athletic departments, towing companies and anywhere that multicultural communications are needed. They are marketed globally in Asia, the Middle East, Africa, Canada and the Americas.

In 2009, the DuoChart Spanish app for use on smartphones was developed to improve communications between healthcare providers and Hispanic patients at Texas hospitals and clinics. That was followed by the creation of the Botswana app, in partnership with the Botswana-UPenn Partnership (BUP).

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