



BRINGING THE RIGHT TECHNOLOGY

An Interview of Dr. Takuro Hatakeyama
by Stella Chang

This interview of Dr. Takuro Hatakeyama from Waseda University in Japan took place while he was a visiting scholar at the University of Hawai'i's Center on Disability Studies. Appreciation is expressed to Ms. Kiriko Takahashi for her introduction and interpretation support.

Dr. Takuro Hatakeyama has a background in electrical engineering for over 38 years. He has worked as a Rehabilitation Engineer and Assistive Technology Researcher in the clinical field for over 25 years. During his career, he has developed numerous assistive technology devices for people with disabilities.

I was curious to find out how he got involved in this field. Dr. Hatakeyama shared that when he was a college student nearly forty years ago, he met someone on the street who had Cerebral Palsy (CP). At the time, he did not know how to interact with the man. Later, he went to Hokkaido for a summer job and met another person with CP who was kept at home as people with physical disabilities are usually kept at home in Japan. The man was not able to communicate much with his family due of his physical condition. The young Hatakeyama wondered if there was a way to communicate with him.

Hatakeyama was also aware that pollution, including environmental toxins, were damaging people's health. These interests helped direct Dr. Hatakeyama in his education and career choice. Initially, he worked with a corporation, but he still wanted to work directly with people. He then decided to take a job at the Yokohama Rehabilitation Center to develop communication aides for people with disabilities.

It was while working at the rehabilitation center that Dr.

Hatakeyama met his wife. This couple has two grown children who work in computer science and nursing. Both of their kids were highly influenced by their father's field of work.

Dr. Hatakeyama primarily works on developing environmental control systems to help people with significant disabilities to independently access a variety of equipment. For example, someone may learn to operate an intercom or door in his or her environment, home, or hospital through a main controller.

One actual example of his work includes developing a communication device for a man with severe CP. He adapted a telephone with a switch so that the man could use head movement to call his caregivers. The same patient used his mouth to control the TV remote.

There was another patient who became immobilized following an accident, and he was losing his will to live because of the challenges he faced. After exploring different areas of interest, Dr. Hatakeyama designed an environmental control device for him and he regained the motivation to live.

Another ALS patient could only use his index finger. With a device made by Dr. Hatakeyama, he was able to control the TV and write with a communication aide. After his health deteriorated and he could no longer use his finger, yet still he could use his eyebrow to control the device.

Dr. Hatakeyama often meets people who are immobile or in a vegetative state. By providing assistive technology and human support, he hopes to improve their daily quality of life and abilities to function. He hopes to also improve his patients' motivation and will to live by helping them regain some degree of independence so they do not have to always rely on others to provide them assistance.

When Dr. Hatakeyama and his team meet with clients with little muscle movement, they interact to see what each person is able to do and what potential he or she may have. They also make sure the families are involved because their support is critical to helping the person who is disabled.

Often times, there was little communication between the user and the high tech company making these assistive tools, so the company did not know how the device was going to be applied. Dr. Hatakeyama started working with the engineers to bridge this gap. As a result, the engineers now get more excited about what they are doing because they now learn what the functional purpose of the devices will be.

In recent years, Dr. Hatakeyama has also worked with people with hearing loss. He wanted to create a device to help deaf and hard of hearing (HH) students be more engaged in the classroom. Typically, deaf or HH students would sit in the front of the class next to their note-takers. They did not look at the instructor; instead, they would keep their head down as they looked at the notes being taken. Dr. Hatakeyama thought maybe the students might want to sit with their friends and be more connected with the class. He developed a new system for the students by creating a pen equipped with a camera that can transfer the information to the students' electronic devices. The note-taker with this pen can support two students at the same time. The deaf and HH students can sit with their friends and be involved in the group discussion and the note-takers do not need to sit in the group.

Dr. Hatakeyama hit a point in his career when he did not think he was going to develop any more devices, until one day, two years ago when he met a Deaf-Blind (DB) person. This DB patient has other physical limitations as well. Dr. Hatakeyama had worked with a person with Multiple Sclerosis fifteen years prior

to develop a vibrator so the patient could feel signals of the device. Based on that design, he developed a small device using vibratory stimuli to enable auditory messages to be composed in Braille Morse Code and checked via a single control switch. There is also a voice/text display for the message that can be displayed to another person. His client was able to learn how to use the system in only five minutes! She hopes to be able to send and receive messages within the social media, and this is exactly what Dr. Hatakeyama aims to achieve in the future. This innovative and compassionate doctor also designed a jungle gym device for a DB child who cannot feel the depth of the equipment. He made pipes connecting to the jungle gym so the child can feel how far apart the bars actually are without risking a fall. Dr. Hatakeyama is still new to the DB community, but he has many ideas and hopes that in the future he will have the opportunity to provide his expertise in support of our DB children.

When asked what his vision is for developing assistive technology, Dr. Hatakeyama shared that he wants to provide Assistive Technology to places where it is not yet available. In Japan, a lot of funding is going into high tech devices because there is a movement and a big interest in

high tech (I.e.: robotics and power suits which could be very costly and may not be practical for real living circumstances). "High tech may not be the right tech," Dr. Hatakeyama shared. He added that there is a need to find the balance between high tech and low tech, and that it is important to bring the right tech support to people in need.

We appreciate Dr. Hatakeyama taking the time to share his work and experience with us. His dedication in what he does has benefitted so many people. We hope he continues to bring wonderful assistive technology to people with disabilities.



Diving into Sounds Waves II: Expansion to the RMI Schools' Hearing Screening and Testing Program

by Ray Miner, Audiologist

Made possible through a grant from the Oticon Foundation, the Republic of the Marshall Islands, Ministry of Education, Special Education Programs' Hearing, Screening, and Testing Program has expanded to include the technical ExpansionRMI13equipment and training of Marshallese to calibrate their pure tone audiometers and tympanometers. Training and the equipment was provided and obtained by Ray Miner, Miner and Associates of Hawaii, through this grant.

With the local capacity to carry out the calibrations, the hearing testing equipment can be calibrated to international standards on an annual basis. Prior to having the local capacity to calibrate the instruments, the equipment had to be either shipped to the U.S. or someone brought in the equipment from the U.S. to do this activity. It is important that the hearing testing equipment used in the hearing

screening and testing program be set to international standards, because otherwise test results could be wrong in either identifying a hearing loss, its severity or normal hearing.

It's important to obtain reliable results and identify those with hearing loss as early as possible so that either medical follow-up can be obtained to ensure medical conditions are corrected as soon as possible and/or accommodations are made in the schools. Some medical conditions left untreated can lead to very serious illness or even death. So those conditions must be found and treated as soon as possible.

For students with a hearing loss not the result of a medical condition, it is imperative to find them and to make appropriate accommodations at home and at school to support the person's speech and language, social, and education advancement.

The Ministry of Education is pleased with their program and the help it is providing to students. The Ministry and Minister Heine have expressed sincere gratitude to the Oticon Foundation, located in Denmark, for their recognition and support of our hearing program. As the Minister stated, "It is important to have the local capacity to identify hearing loss and the capacity to ensure we have working hearing testing equipment."

