

NAFATH



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Working together towards digital inclusion Accessibility innovation in Qatar

Mada Assistive Technology Centre is a non-profit organization committed to connecting persons with disabilities to the world of Information and Communication Technology.

Founded in 2010, to accommodate the UN convention on PWD, in recognition that technology is pervasive across a breadth of private and public sector activities and inherent in the Ministry of Transport and Communications strategy, and works to improve digital inclusion for persons with disabilities in the State of Qatar.

The Qatar National Vision 2030 serves as a clear roadmap to guide economic, human, social and environmental development in the State of Qatar. The growth of our country is dependent on all who live here, and therefore it is our responsibility to cater to all people effectively, support their ability to live independently, and derive equal opportunities when it comes to education, employment and independent living.

Persons with disabilities form an integral part of our society and have tremendous potential to contribute to the growth of the economy. Mada was created to help this community by leveraging on the capabilities of information and communications technology.

The organization strives to do more than just empower an individual; it endeavours to enrich the lives of PWD to the fullest, by addressing issues in the ecosystem to ensure that they have all the required technology to succeed. To deliver on its ambitions, Mada engages in strategic and operational partnerships with critical players in the PWD ecosystem.

Mada prioritises three key areas

Education: Educating both PWD and a variety of stakeholders about the ways in which ICT can be used to enhance life.

Employment: The inclusion of PWD into

mainstream society through harnessing the power of ICT to create employment and nurture entrepreneurship.

Community: Enabling independent living by encouraging the creation of an accessible community for PWD through the power ICT.

Mada also enables these areas through provision of advisory services and policy recommendations.

We are committed to contribute to innovation and the development of new solutions for persons with disabilities, particularly by creating relevant Arabic Language Assistive Technologies, to better serve the increasing local and regional needs. Our outstanding relationship with Assistive Technology important manufacturers and relevant worldwide private sector entities to develop innovative Assistive Technology solutions and services keeps Mada strategically positioned at a crossroads. Our organization is also conducting relevant research studies to keep Mada and the whole region updated on the latest breakthroughs and international best practices.

Mada's newsletter is just another way of spreading important and relevant information about Assistive Technology. Our quarterly publication is an information platform and also a discovery tool: we want to bring together the huge domestic and regional appetite for Assistive Technology products and services with the latest technologies and trends in the whole world.

Like everything we do, we cherish and encourage your support and feedback, as readership's opinion is most valuable to us. This is how we can build a better environment which can best include people with disabilities and how we can all serve a better purpose. This newsletter is sent via e-mail and also available in print, as well as other accessible formats upon request.

Mada team.

GREAT 2017

A great step towards a new AT future!

Between the 23rd and 26th of April, Qatar was the host of one of the most prominent international conferences dedicated to Assistive Technology: GREAT 2017. Almost 30 speakers from around the world took the stage and nourished the overwhelming audience with up to date information, trends, hot topics and current global debates, technologies, services and AT products.

Under the High Patronage of Qatar Ministry of Transport and Communications, organized by Mada in association with ATIA (Assistive Technology Industry Association, USA) and Ministry of Education and Higher Education, GREAT 2017 aimed to provide a knowledge platform by bringing together teachers, educators, academics and technology and product developers to share their know-how and to initiate new dialogue avenues marked by new discoveries, best practices, strategies and R&D.

Hundreds of mainstream and special educators and teachers, school managers, speech therapists, occupational and physical therapists, parents, doctors, policy makers attended the conference, in both its stages.





The first two days, 23rd and 24th of April, were dedicated to a pre-conference module which was targeting professionals needing to get in touch with some of the best AT trainers in the world, amongst whom we mention Joy Smiley Zabala, Dr. Therese Willkomm, Gayl Bowser and Beth Poss.

The conference debuted with full throttle on the 25th, when both the organizers and the sponsors put the GREAT 2017's unique content on its sailing course. No less than 25 keynote presentations and sessions were held during the two days, on a variety of topics in English and Arabic. Studying the audience, we were happy to see that the greatest interest in attending the conference was coming from the education and healthcare sectors. Among the personalities who took the floor were Nadine N. Zeinoun, Mike Park, Ahmed Elsheikh, Dr. Abd Al Kareem Al Hussein, Dr. Ahmed Khater and many others.

Overall, GREAT 2017 had an enormous, positive impact on the AT community in the Gulf region, from a political and a professional perspective. The content we've generated through our media presence (more than 60 articles and two TV reports) reached millions of people in a broader audience, meaning that our goal of improving the perception towards how we address the societal issue of PwDs better inclusion was achieved.

This conference was not only about achieving something, it was also about empowering this Assistive Technology "elite" to deliver their messages and 'know-how' to a larger audience, and to show the whole region's opinion leaders and policy makers that we are on the proper course as an inclusive nation.



The demands of living with a person with Autism Spectrum Disorder (ASD) or Attention Deficit Hyperactivity Disorder (ADHD) are great, and afflicted families commonly experience high levels of stress and challenges on a daily basis. Currently, a number of Assistive Technology solutions are exploring the use of Virtual Reality to create engaging environments and activities to meet the needs of children and adults with ASD, ADHD and learning difficulties.

WHAT IS VIRTUAL REALITY?

Virtual Reality is a computer-generated visual and auditory experience that allows a user to be immersed within a virtual world for various purposes. Used in conjunction with computer input systems, smart phones and wearable technology, Virtual Reality creates a simulation of a real-world experience that the user can enter and leave at any time. Its continuous development will see these simulations become more and more real with the goal being to completely immerse the user in an imaginary environment and allow him/her to interact with virtual characters and objects. Today, further research is focused on how Virtual Reality can better serve a variety of fields such as entertainment, design, gaming, tourism, real estate, education and psychology particularly in connection with individuals with ASD and ADHD.



HOW CAN VIRTUAL REALITY HELP WITH AUTISM?

For over two decades, Virtual Reality researchers have been exploring alternative solutions to help people with ASD. It can provide a safe environment for Autistic individuals where they can practice social and communication skills away from busy, non-predictable situations that they face in the real world, thus supporting their integration in the community and improving social impairments commonly found in ASD and ADHD individuals.

Virtual reality application helps individuals with ASD to practice essential life skills like making eye contact and dealing with crowded situations. The VR applications provide a fun, immersive and engaging therapy that, if proven effective, can be an affordable supplement to traditional therapy. Applications allow adult supervision on a separate device thus ensuring that this therapy is safe to use.

Autistic people can become overstimulated by everything going on around them, making the outside world feel like a terrifying place. A virtual environment, where everything is predictable, provides Autistic children and adults with a setting in which they feel safe and can practice and rehearse social skills that will help them cope with uncomfortable real-life situations.

As we know, VR can be integrated in wearable technology devices that can be used by individuals with ASD to navigate virtual social situations that help them develop life skills which can lead to secure employment and independent living.

MASTERING THE INTERACTION WITH THE REAL WORLD

Through Virtual Reality children and adults with ASD can interact in a safe and controlled environment that serves to reduce anxiety and sensory overload.

The key features include:

- Simplified virtual environments to match the level of input stimuli tolerable by individuals.
- Minimal modification across similar scenes allowing generalization and decreased rigidity.
- Less hazardous and more forgiving environments for developing skills associated with the activities of daily living.
- More emphasis on visual and auditory responses rather than touch. Particularly with Autism, sight and sound have been effective in teaching abstract concepts.
- Additional advantages with the use of body and head trackers. Virtual Reality machines can measure the individual's physical activity and adjust to their actions.
- The potential to regulate an artificial computer environment to fit the individuals' needs and expectations.

The advancements in Virtual Reality technology and its role in helping individuals with ASD and ADHD make sense of the world around them, have been very promising. Together with its use within the Assistive Technology Spectrum, these individuals can benefit from various coping skills to help them overcome the challenges they face in their everyday lives.

To take benefit of this innovative technology in Qatar, Mada works on new challenges and projects to help individuals with ASD and to improve learning skills of children with ASD thanks to study reports for the best practices to implement virtual environment in educational environments and to acquire the latest technologies in Mada AT Center.



Core Vocabulary

Systems for

Augmentative

Communication

What is Core Vocabulary?

Core vocabulary is a small set of simple words, in any language, that are used frequently and across contexts. It contains all parts of speech - nouns, pronouns, verbs, adjectives, adverbs, prepositions, conjunctions, and interjections and serves as a great medium for teaching language.

Core words are familiar and most of them are short - six letters or less. Only a few core words have more than six letters. For example, "sometimes" has nine letters.

From toddlers to seniors, core's simple words make up 80 percent or more of everyday communication and are at the heart of language development.

The SNUG approach

Spontaneous Novel Utterance Generation shortly known as SNUG, allows a person to say anything he or she wants at any time. SNUG is based on access to the individual words, word combinations, and commonly used phrases of our language. It's the long term goal for anyone learning languages.

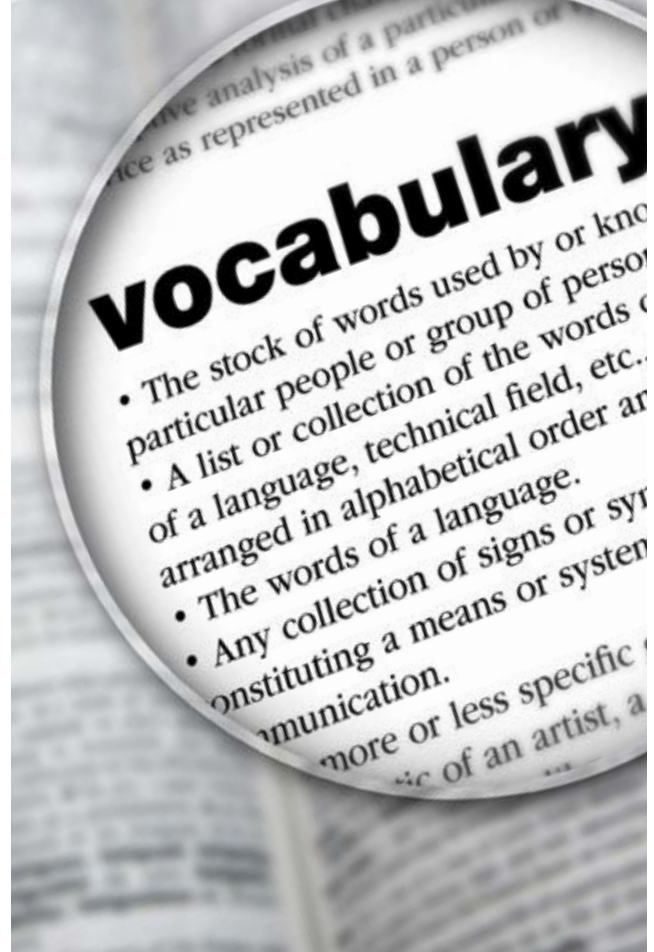
How to get to S.N.U.G?

By providing flexible vocabulary based on the most frequently used words in a language, i.e., Core Vocabulary.

Types of vocabulary

Vocabulary allows expression of a variety of communicative functions, it is useful across contexts and can be combined to increase semantic syntactic complexity. Children learn language from adults who speak to them. There are two types of vocabulary, core and fringe.

Core vocabulary is composed of high-frequency words that are very versatile whereas **Fringe** vocabulary is composed of words that occur infrequently and lack versatility. Core vocabulary is the glue that holds the Fringe together. Fringe vocabulary is tough in the context of core vocabulary, not in isolation.



Aided Language Stimulation

It is a strategy where the communication partner teaches the language on a communication device by combining his/her own verbal language while modeling the selection of vocabulary on the device.

1. Teaching vocabulary and symbols: Identify symbol on overlay, Model with the device the use of the word in multiple contexts reinforcing the meaning.
2. Provide opportunities for the students to use the word on the AAC system following the model.
3. Use a prompt hierarchy to assist the students in activating the targeted word
4. Model Language by using the same expressive communication system the student uses.
5. Teach Motor Planning by giving hand under hand prompts, pointing to the icons and pressing the icons.
6. Each unique motor plan = One relationship
7. Build the boards backwards, if the user is overwhelmed hide buttons and build up as the user needs more language.



QIAT, Please!

Using the Quality Indicators for Assessment, Implementation and Evaluation of Effectiveness

What is QIAT?

QIAT is a set of quality indicators, intent statements, and common errors for eight areas important to the development and delivery of assistive technology services. The mission of QIAT is to guide the provision of quality AT services to improve educational achievement of students with disabilities.

What is QIAT's purpose?

QIAT's purpose is to guide improvement of AT services in order to enhance the educational participation and students' results. It also helps to improve the quality of services and increase their consistency. QIAT also supports the implementation of legal mandates and best practices.

What are the assumptions?

- Require on-going collaborative work.
- Respect ethical practices.
- To be legally correct and aligned.
- To be applicable regardless of the model of service delivery.
- To be applicable to other service plans and programs.

The assessment process

Quality Indicators for Assessment of Assistive Technology needs is a process conducted by a team and used to identify tools and strategies to address a student's specific need(s). The issues that lead to an AT assessment may be very simple and quickly answered or more complex and challenging.

The assessment takes place when these issues are beyond the scope of the problem solving that occurs as a part of normal service delivery. It provides the IEP team with clearly documented recommendations that guide decisions about the selection, acquisition, and use of Assistive Technology devices and services.

Assistive Technology needs are reassessed any time changes in the

student, the environments and/or the tasks result in the student's needs not being met with current devices and/or services. Its implementation pertains to the ways that AT devices and services, as included in the IEP (including goals/objectives, related services, supplementary aids and services and accommodations or modifications) are delivered and integrated into the student's educational program.

Assistive Technology implementation involves people working together to support the students using it to accomplish expected tasks necessary for active participation and progress in customary educational environments.

The evaluation

Quality Indicators for Evaluation of Effectiveness include data collection, documentation and analysis to monitor changes in student performance resulting from the implementation of Assistive Technology services.

The Student performance is reviewed in order to identify if, when, or where modifications and revisions to the implementation are needed.



Visual Supports for Behavior and Communication



What is Visual Support?

Visual Support is the use of a picture, icon or other visual items to communicate with a child who has difficulty understanding or using language. As children with autism or intellectual disabilities are visual thinkers, what they see makes more sense to them than what they hear. Visual support can be used to meet the behavioral, emotional and communication needs of students with disabilities, including autism, executive functioning disorders and intellectual disabilities.

Visual Support in the classroom

- Allows students to focus.
- Makes abstract concepts more visually concrete.
- Reduces anxiety.
- Make a schedule of activities by creating visual schedules.
- Helps organize the classroom by labeling the shelves for better objects sorting.
- Establishes a routine by creating the daily schedule and First-then schedule.

Use of Visual Support in daily life

We all use Visual Support in many aspects of our lives be it to hold memories for longer, to communicate rules and regulations or to organize the environment.

Picture cards can promote accurate and independent completion of daily living activities and thus enhance the individual's quality of life. Daily living picture cards can also be integrated into story strips, functional communication systems, and visual schedules.

Visual Support can be used in teaching emotions, expression and act as a replacement of expressing feelings for those who have trouble processing verbally delivered information, like children with autism.

The importance of core words in communication

Words used in communication are classified as core words and as fringe words. Core vocabulary are those words used with high frequency and make up about 75-80% of the words we use every day.

The use of core words is very important especially for children with autism or intellectual disabilities as it allows them to better communicate their wants/needs and decrease frustration.

We should encourage and emphasizes the use of core vocabulary because these words can be taught and reinforced in a variety of activities and allow for quick and easy 2-word and 3-word combinations. Such activities include play, travel, school, car-rides, meal-time, TV time, and the use of iPads.

EDUCATION TECH POINTS



A framework for Assistive Technology Services Tips by speaker Gayl Bowser, M.S.Ed., Independent Consultant

What is Education Tech Points?

Education Tech Points developed by Gayl Bowser and Penny Reed, is a framework for identifying effective approaches to the provision of Assistive Technology devices and services for children with disabilities, as well as in developing Assistive Technology programs that make sense in educational environments. It provides a set of reflective questions and potential actions to help ensure that Assistive Technology services are appropriate, comprehensive and well integrated into everyday routines and activities.

Education Tech Points has helped many education agencies across the United States and internationally customize and implement effective Assistive Technology services.

What are its routine components?

- 1. Consideration and Referral:** As a starting point, each student with a disability who uses Assistive Technology needs to be assessed.
- 2. Evaluation:** Assistive Technology has to be a component of the initial evaluation of the student's eligibility for special educational services.
- 3. Trial Periods:** trial periods of Assistive Technology devices give us valuable information about the potential for Assistive Technology to overcome barriers posed by a child's disability.
- 4. Plan Development:** IEP/IFSP teams are responsible for determining every aspect of the specially designed instructional program, including whether assistive technology devices and services will be provided.
- 5. Implementation:** Implementation planning including strategies for classroom integration, daily schedules and procedures are essential topics for the educational team to address if Assistive Technology is to become a useful tool.
- 6. Periodic Review:** periodic review is a regularly scheduled review of a student's progress in all areas.
- 7. Transition for students who use AT:** transitions occur each year as a student's progress through the educational system.



iPad Boot Camp: A hands-on workshop

On day 2 of the GREAT Conference masterclass session, went over the iPad's new accessibility features, new apps and new accessories; and explained how these innovative ways to use the iPad have a profound impact and are of great support to children and adults with disabilities.

Below are the key-learnings from the workshop:

iPad built-in features and accessories

- VoiceOver describes aloud what appears onscreen, so that you can use the iPad even if you are blind or have difficulty seeing the screen. VoiceOver is also available in many languages and allows different speaking rates. Go to Settings>General>Accessibility>VoiceOver
- Customized vibration alerts notify the user about the caller's ID or the type of message or alarm that was activated just by the pattern of the vibrations. Go to Settings>Sounds, and select the feature that you want to change the vibration pattern for, then select vibration at the top and customize it.
- Switch Control lets you control the iPad using a single switch or multiple switches. Use any of several methods to perform actions such as selecting, tapping, dragging, typing, and even free-hand drawing. To use a switch, select an item or location on the screen, and then use the same switch to choose an action to perform on that item or location. You can use multiple switches and set up each switch to perform a specific action and customize your item selection method. Go to Settings > General > Accessibility > Switch Control > Switches. If you're adding an external switch, you need to connect it to iPad before it will appear in the list of available switches, e.g. an AbleNet Hook+ is a switch interface that provides a reliable wired connection to the iPad.
- Restrictions allow you to prevent access to specific content on the iPad. You can set restrictions for some apps, and for purchased content. For example, parents can restrict explicit music from appearing in playlists, or disallow changes to certain settings. Restrictions can be used to prevent the use of certain apps, the installation of new apps, or changes to accounts or the volume limit. The passcode you enter to enable restrictions will also be required to make changes to these settings or to disable restrictions. Go to Settings > General > Restrictions, then tap Enable Restrictions
- iPad camera is very useful for live demonstrations. Set the iPad up on a stand orientated to the demonstration and connect it to a projector with an Apple VGA adapter. You can add a

monocle photo lens to get more than the 10x built-in magnification feature.

- For increased accuracy when using the iPad Pro, an iPad stylus can be very helpful. These tools make it easier to draw, sketch, doodle, write notes, and use devices in cold weather, and they help people with accessibility issues that might make touchscreen navigation difficult.

Helpful resources for apps selection

- Two Way Street Communication Therapy Solutions and Resources
A small but good selection of tools and websites for selecting appropriate apps to support children and adults with Complex Communication Needs (CCN) use of iPads and iPods for communication.
- Jane Farrall Consulting
A comprehensive list of apps for Augmentative Alternative Communication (AAC) and switch accessibility.
- AAC Tech Connect, Inc.
It provides innovative clinical tools which simplify your Augmentative Communication (AAC) evaluations. An easy to navigate website with simple graphics for making clinical decisions for AAC. Provides tools for app evaluation to select the best app for individual's communication needs.
- 138 Apps for Early Learning for Blind, Low Vision and Multiple Disabilities <http://www.pathstoliteracy.org/blog/apps-early-learning-blind-visually-impaired-deafblind>
- Teaching Visually Impaired
<http://www.teachingvisuallyimpaired.com/apps.html>
- 27 visual, sensory, and augmentative apps for autism <http://www.eschoolnews.com/2013/06/14/27-visual-sensory-and-augmentative-apps-for-autism/?all>
- App Advice
Apps for the Deaf and Hearing Impaired.
- iPads for Communication Access Literacy and Learning, published by CALL Scotland.
A fabulous resource on basic and more advanced iPad features.

Taking AT Along:

Helping students who use AT make transitions to new settings

All individuals move from one activity to another and from one setting to another throughout the day. Whether at home, school, or in the workplace, transitions occur frequently and require individuals to stop an activity, move from one location to another, and begin something new. Individuals with Autism Spectrum Disorders (ASD) and People with Disabilities (PWD) may have greater difficulty in shifting attention from one task to another or in changes of routine.

Workshop Highlights

1) Assistive technology used by people with ASD or PWD, in a particular setting or environment is not necessarily transferable to a new setting; be it in work, at school, or in a given community environment.

2) Factors affecting transition to new settings are: individual needs and skills, opportunities, environmental demands, attitudes of peers & partners and available support. The transition to a new environment must ensure that the right steps are taken and that the AT is tested.



3) Negative reasons to discontinue the use of AT:

1. It is not needed and/or is difficult to use.
2. It took too much time and cost to maintain.
3. It did not match the needs and requires too much help.
4. It did not match the environment.

4) Positive reasons to discontinue the use of AT:

1. An increase in function/skills where the AT device is replaced with a better equipment.
2. Change in the needs or priorities and/or a move to a new environment.

5) To ensure that individuals continue using their AT in a new environment, the following needs to be considered:

- What tasks performed in the new environment will require the use of AT?
- Will the same technology work in the new environment?
- What new skills and supports might the individual need in the new environment?

6) Four skills areas for independent AT use:

1. Operational Skills: how to make AT work
2. Functional Skills: what can AT help you do (function of the device)
3. Strategic Skills: when and where to use AT
4. Social Skills: self-advocacy and self-regulation, how to use AT around others and how to explain and advocate your use of AT

7) As part of Transition Quality Indicators, plans have to address AT needs of the student, including roles and training needs of team members, subsequent steps in AT use, and follow-up after transition takes place.

8) Transition planning empowers students using AT to participate in the transition planning based on their age and ability levels.

9) Advocacy related to AT use is recognized as critical and planned for, by the transition team. AT requirements in the receiving environment are identified during the transition planning process.

10) Transition planning for students using AT proceeds according to an individualized timeline. Transition plans address specific equipment, training and funding issues such as transfer or acquisition of AT, manuals and support documents.

It is important for the team to continually assess how transitions impact individuals with ASD and PWD. Depending on the activity, environment, and the specific needs and strengths of the individual, a variety of transition strategies may be appropriate.



Two worlds become one Innovation in Communication between Deaf and non-Deaf

Back in the days, before smartphones or the internet, deaf-run businesses relied on fax machines to take orders. The deaf could also use a teletypewriter, or TTY, which transmitted text as a printout or on a screen - a good way for them to communicate with each other, but not exactly widely adopted among the hearing. These services were a big deal for deaf communication, but the process was slow and strenuous. Then along came smartphones and tablets, forever transforming the way the deaf communicate.



Two-way Communication

Innovative solutions have come a long way in providing effective, two-way communication between Deaf sign language users and people who use spoken languages. Such solutions can potentially translate Sign Language into voice and converts voice into text in real-time. Innovative solutions facilitate secure and private conversations between deaf and hearing users. These technologies have a significant potential to impact the lives of people with hearing impairment within Qatar and the Arab region as they are the first of its kind in the market. Some example of such solutions are SL recognition devices and tools, Sign Language Conversational Agent (Avatar), Accessible Mobile Apps for Deaf, etc.

Game-changing Technology

The World Health Organization (WHO) estimates that there are more than 360 million people worldwide with a disabling hearing loss, including 32 million children and one-third of people over 65 years of age. Hearing loss may result from genetic causes, complications at birth, certain infectious diseases, chronic ear infections, the use of particular drugs, exposure to excessive noise and aging. Recent advances in technology have the potential to improve the quality of life for those who are deaf or hard of hearing. Here's a look at a set of innovative solutions designed to provide effective, two-way communication between Deaf sign language users and people who use spoken languages.

Sign Languages Recognition

The first requirement for sign language recognition is to capture the gestures that are made as signs. This technology is already adept at reading hand and body movements, and is incorporating sign language into its motion-sensing vocabulary that's meant to help the deaf. Developers and Researchers use Infra-Red Camera to record signs from deaf person. Infra-Red Camera allows to save depth information as a third data. Once Deaf person have captured the data on the hand positions, shapes and movements, the individual signs have to be recognized. There are three parts to this. First there is the segmentation of the signs; where does one sign end and the next begin. Second, we apply some approaches to compare segment to existing data stored in digital dictionary. Third, we turns captured Sign Language segments into words spoken by a computer. Nowadays, we found many devices and software that ensure a two-way communication between Deaf and hearing people.

Avatar's Technology

Avatars are digitally created characters that turn speech into sign language. They are being developed for a wide range of uses including television sets and setup boxes and to help to make the web more accessible to Deaf, hard of hearing and speech-impaired users. Avatar's Technology presents a good way to learn text language and to translate text and speech to Sign Language.

Accessible Mobile Devices for Deaf

Deaf individuals can use mobile devices to communicate easily with other Deaf thanks to video conversation applications. But, the communication with hearing persons causes some issues. First, hearing individuals cannot understand Sign Language. Second, Major of Deaf persons can't read or write messages (SMS) to communicate with hearing persons. So, to ensure a well communication between hearing and Deaf persons we use Sign Language Recognition techniques and Avatar Technology at the same time. Many research projects had been launched to do this. For example, we found technology that convert SMS message to video content containing virtual agent that convert the text to Sign Language.

For its part, Mada has supported many initiatives to develop Avatar translating text content to Arabic Sign Language toward make website contents accessible for Deaf community. This is a foretaste for the next edition of Nafath, where we will focus more on Avatars Technology and how Mada can support and implement this technology for Qatari websites using a high advanced avatar. .

Wayfinding Solutions for the Blind and the Visually Impaired:

A promising opportunity to enhance their life



In recent times there has been a number of innovative solutions developed to facilitate indoor and outdoor navigation for people with blindness and other visual impairments. Such technologies, have diversified over time to be integrated to work with smartphones, tablets, smartwatches and similar devices. These advancements are overcoming barriers for PWDs with visual challenges to navigate independently with various environments.

The challenges faced by Blind and Visually-Impaired people

Wayfinding in built environments presents many challenges for blind and visually-impaired people (BVI); they find it hard to determine their own position, direction and surroundings. BVI need to know more about objects features through auditory canal. For example, when a BVI person arrives to the entrance of an unknown building, he/she needs to know important information like number of floors and number of offices, stairs and lifts locations, and types of doors, e.g., a push door, a sensor door...etc. Currently GPS, smartphones and other handheld devices provide location-based technologies to support navigation outdoor and indoor. Inside buildings, wayfinding and navigation becomes even

more challenging, because they are out of reach of GPS tracking. Many of them are based on visual guiding information like maps to be followed on a device or on info boards

Difficulties in wayfinding may cause stress and anxiety, which may lead to situations where BVI persons avoid leaving home or visiting unknown, complex places and large-scale spatial environments, like shopping malls, without assistance. In modern cities, wayfinding instructional information is mostly presented in a visual form, which means it is not accessible for BVI people. Therefore, it is hard for them to gain a non-visual overview of a new place, and to map its landmarks.

How technology is helping the Blind and the Visually-Impaired

Nowadays, most technologies offer solutions for indoor and outdoor navigation issues. For the outdoor navigation, a GPS is a good way to find a location and/or to reach your destination. When indoors, a GPS becomes less accurate and does not deliver additional information about the location and/or premises, e.g., a building. Luckily the rapid development of wayfinding technology and devices is providing new solutions for the BVI. Below, we will explore two main technologies: RFID and Beacons.

Radio Frequency Identification:

Radio Frequency Identification (RFID) is an accurate and usable indoor wayfinding system currently available to low-vision persons who rely on the use of **RFID** tag technology. **RFID** tags are built-in with electronic components that store an identification code that can be read by an **RFID** tag reader and uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information.

For indoor navigation, **RFID** provides travel information from one place to another, describing position and location. It can be inserted in pathways, inside buildings and give more information about floors, rooms, corridors, halls, etc.

For outdoor navigation, it provides information about routes, streets and buildings names, while navigating. Each **RFID** tag contains a unique ID and an antenna that creates a small charge enough to cause the tag to transmit the user's ID. A BVI person can be monitored through information from a central database and get the required help in case of an emergency. The **RFID** system makes a BVI person feel secure and helps them to navigate from one location to another using static information stored in a tag.

Beacon:

Another accurate solution for indoor navigation is using **Beacon** through **Bluetooth Low Energy (BLE)**. It is an application-friendly version of Bluetooth that was built for the **Internet of Things (IoT)**, an inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange data.

BLE communication consists primarily of advertisements, notifications or small packets of data, broadcasted at a regular interval by **Beacons** or other **BLE**-enabled devices. **BLE** advertising/notifications is a one-way communication method where **Beacons** that want to be discovered can broadcast, or advertise self-contained packets of data in set intervals. These packets are meant to be collected by mobile devices such as smartphones or tablets, where



upon receipt a variety of mobile applications can facilitate triggering of push messages, app actions, or prompts.

The notification received from **Beacon** contains essentially the location and calculates proximity to other locations and proposes more information from cloud servers through a **Beacon** identifier. This technology is the most advanced solution for indoor navigation that can identify passengers stuck in airports and at train stations for example, or, to track a seat in a stadium or to communicate event promotions and information in malls or home automation tasks and much more.

In the case of an outdoor environment, hybrid systems can be a navigation solution using both a GPS as the main information source, an RFID and Beacons for correction and minimization of location error and providing more information about the nearest location.

The future of smarter accessibility for the blind and visually-impaired looks bright, as more establishments recognize the importance of implementing interactive wayfinding.

While many innovative technologies available today have come a long way in helping the blind and visually-impaired achieve independence; several technologies are in still development to solve indoors navigation needs and wayfinding challenges all around the world.

All above technologies presents innovations especially for the blind and the visually impaired peoples. As an assistive technology center in Qatar, MADA will continue to support innovative ideas and research in this field and provide a support covering research and innovation for all organizations in Qatar to how implement those technologies in many areas like airports, offices, malls and schools.

Ready SETT GO !

Using the SETT Framework for collaborative decision-making in Assistive Technology and beyond

Conference date: 23 April 2017
Presented by: Dr. Joy Smiley Zabala

Key tips from the GREAT conference include:

- 1- The goal of the SETT framework is to help collaborative teams create student-centered, environmentally- useful and task-focused tool systems that foster the educational success of students with disabilities.
- 2- What makes an item “assistive” is how it is needed for a person with disabilities to do what would be difficult or impossible without it.
- 3- An Assistive Technology service is any service that directly assists a person with a disability in the selection, acquisition, or use of an assistive technology device.
- 4- The primary goal of Assistive Technology is to enhance capabilities and remove performance barriers.
- 5- Assistive Technology is related to function rather than to a specific disability.
- 6- Assistive Technology does not eliminate the need for instruction in social and academic skills.
- 7- Progress is usually made in steps. Plan the steps and use measures to capture progress. The “end” in AT devices and services is a moving target.
- 8- Create a learning field where all student have the tools they need to accomplish tasks that lead to educational achievement and a means to demonstrate it.
- 9- Progress is measured not only by the questions we have answered, but also by the questions we are still asking or have just begun to ask, for knowledge alters what we seek as well as what we find.

Creating Assistive Technology Solutions in Minutes



by Therese Willkomm, PhD, ATP, Clinical Associate Professor at the University of New Hampshire

Workshop Highlights

Key learnings from Day 1 of the workshop include:

- How Assistive Technology (AT) can be easily modified or customized.
- The Different ways in which you can modify off-the-shelf AT solutions.
- The Necessary tools to create AT solutions at home, such as pliers, PVC cutters, utility knives, scissors, and PVC material.
- Examples on how to create AT solutions from scratch when the perfect solution doesn't exist or is too expensive.
- How to use different materials such as corrugated plastic, Loc-line plastic, Velcro, glue, duct tape, and pipes to make tablet holders, smartphone mounts, cup holders, adaptive eating solutions and more!
- Therese stated that she designed and fabricated over 2000 solutions for individuals with disabilities.

Additionally, key take-aways from the workshop were:

- iPad stand examples and mounts for wheelchairs.
- The importance of mounting devices and how creating them at home can save a lot of money and offer custom-built mounts for individuals instead of buying generic solutions that may or may not work.
- Head mounts options for devices, drinks, writing tools, pointing tools, and eating.
- Opportunities to create AT devices for mobility such as cars.
- The opportunities to include people with disabilities in normal life activities such as taking care of home chores using specialized custom-built AT devices, mounts, or solutions created at home.
- Different ways to create Stylus and other pointing tools to use with smartphones and iPads.

Accessibility to inclusive education



The right to education is an example of the indivisibility and interconnection of human rights due to their major role in full and actual recognition of other human rights such as the economic, social, cultural, civil and political rights. This interconnection is reflected in PwDs, such as when they are ensured to have the same level of education on an equal basis with others as a prerequisite for their right to work or when they are ensured to study in public schools as means of supporting their right to live in society.

Most often, the society's misunderstanding of the different types and forms of disability and the limited ability of those responsible of meeting special needs leading to marginalizing PwDs. Hence, many end up suffering from discrimination in their daily lives and little opportunity is provided to them to have proper education.

Within the field of education, PwDs face obstacles that limit their ability to access educational services. These obstacles can take several forms. They can be physical, technological, general or financial. They could be the result of the learning service provider inefficiency in providing the required configuration in time.

Technology provides disabled students the support to overcome the obstacles they face in accessing education, participation and in improving their educational progress. It is important for the educational policy to reflect the vital role of assistive technology to ensure the provision of an inclusive educational sector.

The UN Convention on the Rights of Person with

Disability recognizes the right to education as a basic right of PwDs. The convention calls for providing that education, wherever possible, "inclusively". That is, within the context of the general educational system, rather than in a separate learning environment. Article 24 state certain representations that include the provision of "reasonable accommodation" for the requirements of the disabled students. This accommodation may include accessibility to information and communication, including affordable assistive technology and learning materials.

Inclusive education is one of the main requirements for the provision of a high quality education for all learners and the development of more inclusive societies. It also constitutes a part of a larger strategy that enhances comprehensive development, with a view to create a world of social justice and sustainable use of resources where the main needs and rights of all are met. Studies on the education of PwDs confirm that only inclusive education can provide quality learning and social development for PwDs, which makes it the most suitable type of education that can guarantee a global and indiscriminative right to education. Assistive technology and accessible learning resources provide disabled students with more opportunities to enjoy accessibility to the inclusive educational system and earnest involvement in the educational curricula side by side with their non-disabled peers.



Schools using accessible ICT to enable PwDs to have education in an inclusive environment should adopt the use of ICT in all the fields of preparing curricula according to four main areas defined by UNESCO for curricula through which the ICT, reading and writing skills can be upgraded:

- 1- Learning ICT: to learn ICT skills as a separate subject.
- 2- Applying ICT to subject fields: to develop ICT skills within separate subjects.
- 3- ICT penetration throughout the entire curriculum: to integrate or include ICT in all subjects.
- 4- ICT specialization: to teach and learn ICT as an applied subject to train students in a profession.

Mada believes that education is the main method to include PwDs in life. One of the main goals of Mada is to enable 80% of disabled students to have quality education by 2018. The center is enhancing its contribution in the field of education and its support to disabled students through:

- Contributing to improving the normal learning environment.
- Building assistive technology skills in Mada partner organizations.
- Evaluating disabled students.
- Providing training courses to raise the awareness of assistive technology and enhance its use.
- Providing schools with the assistive technology school kit and providing the guidelines of the needs of disabled students.
- Training teachers and specialists to enable them to provide the required aids to disabled students.