Lifelong Mobility Initiative: dissemination phase final report

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EXECUTIVE SUMMARY

This project is the dissemination phase of the Lifelong Mobility initiative that was started by the Benter Foundation in 2010. In our previous work we developed the concept of the Depot, worked with Teletón staff to plan for the Depot's design, trained Teletón staff on how to maintain and repair wheelchairs, and evaluated the wheelchairs that were delivered at Guanajuato site. During a site visit, we also conducted key informant interviews with Depot staff and clinicians to understand their needs to move forward with the complete operationalization, implementation, and integration of the Depot on 11 other CRITs. We also administered an online survey to all of the CRITs' general managers. We have implemented an online course to support the implementation of the Assistive Technology Shop (formerly the Wheelchair Depot which was renamed based on the CRITs request). Forty-three people from 12 CRITs participated in the online course. The course included 4 modules: 1. Assistive Technology Standards, 2. Assistive Technology Acquisition, 3. Wheelchair Maintenance and Repair, and 4. Database and Wheelchair reuse/recycle. After the online training modules, we administered an on line evaluation survey, and performed a phone meeting with all participating CRIT teams (except CRIT San Antonio) to get feedback on the course, and record strengths, weaknesses, opportunities and threats of the AT Shop. Additionally on August 13th we conducted an onsite in-person workshop at the CRIT of Estado de Mexico. Participants found the online course and in-person workshop extremely valuable. As of now, CRIT Baja California Sur has provided assistive technology services with a total of 102 wheelchairs maintained, 184 repaired, and 170 adjusted. They have delivered 45 wheelchairs, provided postural support and cushion to 42 users, and performed 100 assessments. CRIT in San Antonio (Texas, US) has implemented assistive technology services since their opening in 2014. Three CRITs have identified the space for both the AT Shop and AT Laboratory and are working on setting them up. 6 CRITs have the AT Shop ready, have identified the space for the AT Laboratory and are working on setting it up and one CRIT has the AT shop ready and equipped with tools.

METHODS

We recorded each training module on Adobe Connect and participants watched the module on-demand. At least one follow up activity was assigned per module and posted online approximately two weeks after each module. We held a live online meeting to answer questions, discuss the module's activity and the progress towards implementation. Team members from the University of Pittsburgh were available via email and phone call as needed. After the training we asked participants to individually answer an online evaluation survey. The survey had 46 closed questions and 7 open questions for comments on what they liked, disliked about the course and comments to improve it. The survey evaluated the general quality of the course, instructors' performance, the importance of different course components, modules, homework, course environment, course logistics, and general course perception. On August 13th, 2015 an onsite workshop took place at the University of Teleton in Estado de Mexico. During this workshop participants worked in groups with a wheelchair following the manual wheelchair maintenance checklist to inspect the wheelchair. At all times participants were involved and interested. After finishing the hands on activity participants were asked to give

their feedback and comments about the activity, and to describe the current status on the implementation of the AT shop and Lab.

MAJOR FINDINGS

Four modules were delivered and activities' questions were addressed during the online discussion meetings. After the online training, a course evaluation online survey was administered, and an in person workshop took place at the Estado de Mexico site.

Regarding the progress of the Assistive Technology Shop and Laboratory one CRIT, Baja California Sur, is already providing Assistive Technology (AT) services in their new AT space (Laboratory and Shop). They have been in operation since September 2014. A total 102 wheelchairs have been maintained, 184 have been repaired, and 170 have been adjusted. They have delivered 45 wheelchairs, provided postural support and cushion to 42 users, and performed 100 assessments. 3 CRITs: Durango, Michoacán, and Sonora, have identified the space for both the AT Shop and AT Laboratory and are working on setting them up. 6 CRITs: Puebla, Edo de Mexico, Guerrero, Hidalgo, Cd de Mexico, and Chihuahua have the AT Shop ready, have identified the space for the AT Laboratory and are working on setting it up. One CRIT, Chiapas, has a small AT Shop with few tools, and they do not have the Laboratory ready yet. CRIT San Antonio is also providing AT services since it started operations in 2014. American Wheelchair Mission has wired $5,000 to the CRITs involved in this project to purchase the basic tools needed for the Assistive Technology Shop.

Regarding the ISO standards: The majority of the suppliers were not aware of the ISO standard ISO 7176, only one wheelchair model among CRIT's wheelchair supplier has a certificate of conformity with the requirements of the European Council for medical devices.

CRITs reported to have wheelchairs from 8 different manufacturers and a total of 24 different wheelchair models. Participants found the W-MAT tool useful, practical and thorough. They suggested including sections about tilt in space, seating system insert, and seatbelt to the W-MAT. In general all participants perceived that it would be feasible to implement the maintenance-training program, but they identified some barriers. Participants suggested to include more information about pediatric and power wheelchairs, and to have the training program translated into different dialects. Almost all participants expressed that the reuse and recycle program will benefit their patients, especially those with less resources. Social workers expressed that it is common to find abandoned equipment at patients' home and/or school, but bringing those devices back to the center would be difficult by the social workers themselves.

The course evaluation showed that the majority of the participants found the online training to be clear, useful and complete, although audio was perceived as a barrier. For the online course, most of the CRITs identified as a weakness the lack of hands-on practice, and suggested to have an in-person meeting, and more hands-on practice. There was a general concern about the lack of clarity on the administrative details (how to schedule services and personnel expectations) and on how the AT Shop and Laboratory will be implemented. There are also concerns about the availability and affordability of assistive technology as well as wheelchair spare parts in some of their settings. Some of the things they liked the most about the course included the modules' content, especially the wheelchair maintenance and repair, and recycle and reuse content because these modules introduced new information and challenged their

current way of thinking. They also liked the readiness and availability of the instructors, and the opportunity to share knowledge and experience among other CRITs. They did not like that they often encountered problems with the audio, especially during the recitations. Some of the suggestions on how to improve the course were to include information about low cost technologies, pediatric wheelchairs, and keep participants updated on new technologies, and continue with feedback and follow up. Regarding the in person workshop participants found it useful, relevant, enjoyable, and understandable, although they mentioned that it was too short and that they would like to have more practice in performing wheelchair repairs.

INTRODUCTION

The Lifelong Mobility initiative was started with the belief that all children with disabilities in developing countries should have lifelong access to an appropriate mobility device. Wheelchairs are an important source of mobility often denied to children in developing nations because of their cost and a lack of associated services. The vision of the Lifelong Mobility project was to expand access to wheelchairs to children by increasing the lifecycle of each wheelchair through regular maintenance and repair. The parts from wheelchairs at the end of their lifecycle are salvaged to keep other donated wheelchairs going.

The Lifelong Mobility initiative has already completed three phases funded by the Benter Foundation. The first phase of the initiative set out to examine and understand wheelchair donation process in part by studying the operations of the American Wheelchair Mission in Central Mexico. In addition, this phase studied the needs of wheelchair recipients and their family members and evaluated how well donated wheelchairs from the American Wheelchair Mission were meeting these needs. This phase of the project revealed that donated wheelchairs frequently fall into disrepair (sometimes only months after they are donated) and that wheelchair users and their families often have few options available to repair them. Continuing to use the wheelchair in this state can result in a rapid deterioration of the wheelchair and a dramatic reduction in its lifecycle. As a result, children that gain mobility from receiving a donated wheelchair can have that mobility quickly taken away by a bent rim, ripped seatback or broken frame. The recommendations during this phase of the project included developing a Depot to Repair, Retrofit, Recycle, and Reuse (4R) donated wheelchairs in Teletón sites throughout Mexico. Teletón was viewed as an ideal partner for this venture because they are the largest provider of pediatric rehabilitation services in Latin America.

The second phase of the Lifelong Mobility initiative built on the first phase by developing a model framework for a 4R Depot that could be disseminated to Teletón sites throughout Mexico. The work in this phase culminated with a pilot test of the model framework at the Teletón site in Guanajuato Mexico. During this pilot test, we trained Teletón staff members who would be working in the Depot to conduct a full wheelchair assessment using a standardized checklist and to conduct repairs to wheelchairs. We also donated tools and equipment to the Depot necessary to complete these repairs. To test the concept of the 4R Depot, we created a "wheelchair exchange" program that allowed wheelchair users and their families to exchange a damaged wheelchair for a new wheelchair. This allowed us to build a stock of used wheelchairs that could be repaired and reused. In addition, it helped to seed the parts that would be needed to run a fully functional repair Depot. Caregivers who returned the wheelchairs were interviewed about the utilization of the wheelchair and their impressions about how and why the wheelchair broke. The pilot was so successful that the leadership at the Guanajuato Teletón site decided to fully implement the Depot and began making plans to build a Depot onsite.

The third phase of the Lifelong Mobility initiative evaluated the feasibility of using locally sourced wheelchairs in the Depot. We compared and evaluated a basic pediatric wheelchair from Fundacion Bertha O. de Osete (FBO) to a pediatric wheelchair manufactured in China by Drive Medical. Neither of the wheelchairs was found to meet international durability standards, the users' needs nor the environmental needs.

This report describes our work and key findings for the dissemination phase of this initiative. First, we describe the assistive technology service that has been implemented at some CRITs and will be implemented by the others. Second, we describe the progress each site has made towards implementation. Third, we describe the on line training program modules, activities and key findings. Finally we summarize course and in-person workshop evaluation results.

ASSISTIVE TECHNOLOGY SERVICE

Based on the experience from the CRIT Guanajuato, the CRIT Baja California Sur started a new assistive technology service. To support this service they implemented the Assistive Technology Laboratory (AT Lab) and the Assistive Technology Shop (AT Shop). The Assistive Technology Shop is the new name given to the Wheelchair Depot. The description of these two services is based on CRIT Baja California Sur internal guidelines. The objective is that participating CRITs will follow these guidelines.

The dissemination phase started with a 2-hour in-person presentation during a workshop on assistive technology, which was held in June 2-4th in Cancun, Mexico. All the physicians and some therapists from the entire CRIT network participated in this workshop (+100 attendees). After this workshop Teleton's directives selected the 10 CRITs that were going to implement the Assistive Technology Laboratory and Shop. These CRITs are: Chiapas, Chihuahua, Ciudad de México, Durango, Estado de México, Guerrero, Hidalgo, Michoacán, Puebla, and Sonora. Baja California Sur and San Antonio (Texas, US) also wanted to participate in the online training; therefore, a total of 12 CRITs participated in the dissemination phase. Both of these CRITs have AT services already in place. We are glad to report that Yasmin Garcia, who worked in the Lifelong Mobility project in CRIT Guanajuato in 2011, was hired as the rehabilitation engineer who coordinates the assistive technology services in San Antonio. Figure 1 shows the location of the CRITs that participated. Locations in green show CRITs with AT Shop and Lab currently in operation.

**Figure 1: Location of participating CRITs in Mexico**

The mission of the new Assistive Technology Service is ¨To support the rehabilitation process and social inclusion of the children and adolescents that they serve through the recommendation, prescription, delivery, and training on the use and maintenance of an assistive technology device that meets each patient´s needs and it is compatible with their ability and aid to accomplish daily living goals¨[1]. Below is a brief description of the steps the AT service entails (Figure 2).

a. Interdisciplinary evaluation: an interdisciplinary team will evaluate the child´s needs. The child and his/her family will be active members during the evaluation and will set goals, choose the assistive technology device(s) that will be tried, and select the device to be prescribed.

b. Trials with assistive technology devices: in the AT Lab the child will try AT devices with the support of the AT expert and the technician. Based on these trials the AT device that is going to be prescribed is selected.

c. Purchase: the social worker with the support of the technician and AT expert will help manage the acquisition of the device.

d. Fitting: once the AT device is acquired, the user will try it in the AT Lab with the support of the AT expert and the technician. Adjustments and modifications will be made to the AT device as needed. The adjustments/modification will be carried out at the AT Lab, AT Shop, or by the AT supplier on a case-by-case basis.

e. User training: the technician and AT expert will train the child and his/her family in the use and care of the AT device.

f. Delivery: The physician and the interdisciplinary clinic will handle the final delivery of the device to the child and his/her family. Each device will be delivered with the user manual, supplier warrantee, and the preventive maintenance instructions.

g. Maintenance/Repairs/Recycling: maintenance and basic repairs will be performed in the AT Shop by the technician and/or AT expert.

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[1] Adapted from: "AT Procedure" CRIT Baja California Sur

Figure 2. Assistive technology area workflow[1]. The steps in purple take place in the AT Lab and the steps in orange in the AT Shop.
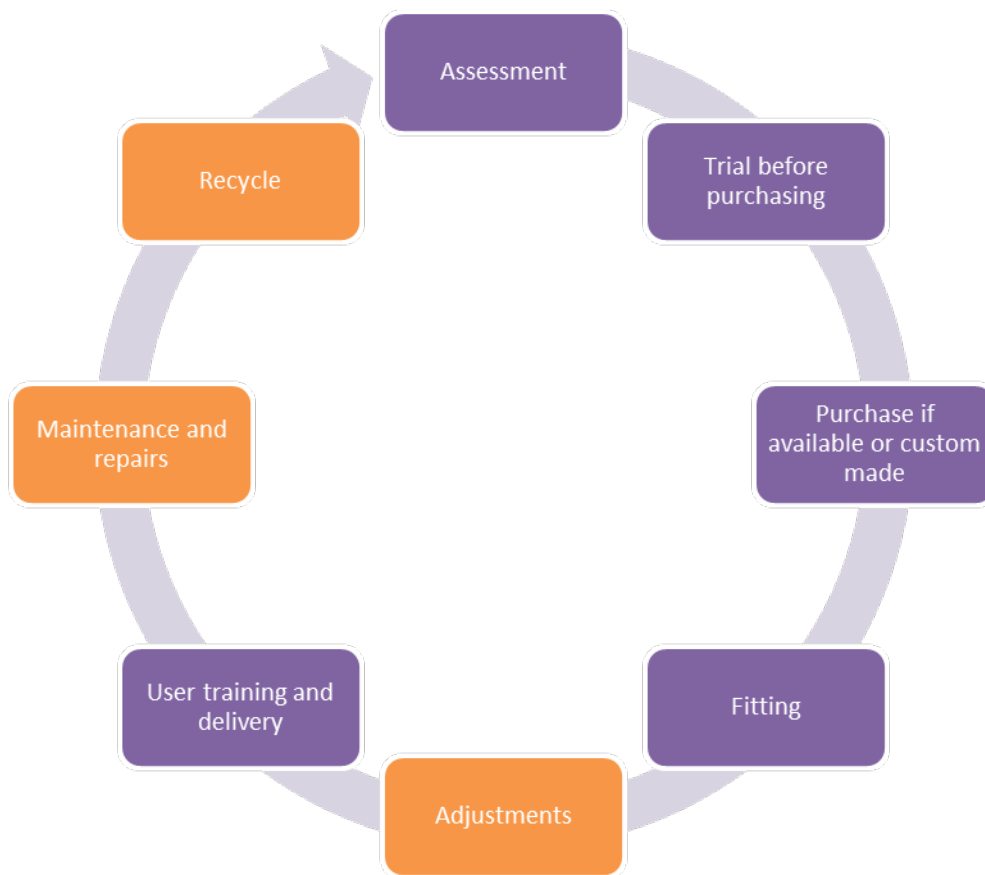
Assistive Technology Laboratory (AT Lab)

<u>**Objective:**</u> to have a dedicated space for the AT service. It will have an AT device demonstration area. The device trials, some adjustments, and user trainings will occur in this area.

<u>**Personnel:**</u> The AT Lab will have one AT expert and at least one technician. The number of technicians will depend of the variety of AT devices that are provided. For instance, for wheelchair and walking aids provision the technician could be the person who is in charge of the wheelchair port (Puerto de sillas). On the other hand, for augmentative and alternative communication devices and computer access the technician could be the information technology technician.

<u>**Training:**</u> the University of Pittsburgh with the support of the CRITs delivered an online training program in assistive technologies. The program started in October 2014 until May 2015. It finished with a 1.5 day in-person workshop at Estado de Mexico. Some of the modules in this training program were: Demystifying disability, Seating and mobility, Computer access, Environmental control units, Augmentative and alternative communication, Prosthetics, Devices for cognitive disabilities, Driving with a disability, Wheelchair transportation, Sports and recreation, Ethics, and Low vision and Audiology.

<u>**Physical space:**</u> ideally the AT Lab will be located within the therapy space with a minimum area of 25 m^2 (269 ft^2). The space should have room for the following:

a. Private assessment room: if the child´s evaluation is going to be done at the AT Lab, there needs to be space with privacy.

b. Showroom: this area will depend on the variety of AT devices that are going to be provided at each CRIT. Figure 3, shows an example of the demonstration products that they have for seating and mobility.

c. Space for trials: the area will vary depending of the types of AT that the CRIT will provide. For instance, there needs to be room for at least two wheelchairs so if the child is going to try a new wheelchair and he currently uses one there is space for both. Mobility trials can be performed in a hallway for example.

Figure 3. Showroom of mobility-related AT in the AT Lab at CRIT Baja California Sur.

Consumables: disinfecting agent to clean the AT devices and work surfaces after every evaluation and trial. Foam in different shapes and sizes are very useful during evaluations and fittings for mobility and positioning devices.

Furniture, devices, and tools

a. Private assessment room: this space needs to have a mat table and a wheelchair scale.

b. Showroom: it would depend on the AT devices that would be provided. For wheelchairs it is necessary to have wheelchairs with different features and sizes. For example: light wheelchairs and wheelchairs with postural supports. It is important to have organizers to store these devices in a manner that saves space and also allows the personnel to have them handy and visible (Figure 3).

AT Shop – previously Wheelchair Depot

Objective: to have a dedicated space to adjust, maintain, repair, modify, and potentially fabricate AT devices.

Personnel: the AT Lab personnel are also in charge of the AT Shop.

Training: online training from November 2014 until April 2015 with an in person session in August 2015. Table 1 contains the timeline of the AT Shop training program.

Physical space: according to CARF[2] standards, areas that have tools that could potentially harm patients need to be away from the therapy spaces. An area of at least 30 m^2 is required. There needs to be space to store tools and consumables, equipment, a worktable, and a desk. Figure 3 and Figure 4 show examples of AT Shops in which workspace, tables, tools, and storing area are shown.

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[2] Commission on Accreditation of Rehabilitation Facilities http://www.carf.org/home/

Furniture, equipment, tools, and consumables: it is necessary to have enough storing (e.g. shelves, drawers, containers) to store the tools and consumables. Ideally, there will be a cart for hand tools like the one used in Guanajuato (Figure 3). The person who controls the inventory and the AT Shop services would need a computer. Ideally this computer will be connected to the CRIT network to access the appointments. Based on what CRIT Baja California is currently using Figure 4, a list of basic tools and consumables has been attached in Appendix 1.

Table 1. Assistive Technology Shop online training and implementation schedule.

Module	Nov	Dic	Jan	Feb	Mar	Apr	May	Jun	Jul	Agu
Introduction	▓									
Assistive Technology Standards			▓							
Assistive Technology Acquisition and Stock				▓						
Manual wheelchair maintenance					▓					
Manual wheelchair repairs					▓					
Wheelchair Maintenance Assessment Tool (W-MAT)					▓					
Logistics for wheelchair maintenance training for users and caregivers					▓					
Wheelchair reuse and recycle program						▓				
Proposed database structure and fields						▓				
Online course evaluation							▓	▓		
In-person workshop										▓

Figure 2. AT Shop at CRIT Guanajuato.

Figure 3. AT Shop at CRIT Baja California Sur.

IMPLEMENTATION PROGRESS

As of August, 2015, one CRIT, Baja California Sur, is already providing assistive technology services in their new assistive technology space (Laboratory and Shop). They started operation on September 2014, and have provided a total of 670 services. Table 2 shows a detail of the services provided.

Table 2. Baja California Sur AT Shop and Lab statistics

Service Description	Number
Assessment	100
Deliveries	45
Waitings/Training	27
Adjustment	170
Postural Support/Cushion	42
Repairs	184
Maintenance	102
Total	670

3 CRITs, Durango, Michoacan, and Sonora, have identified the space for both the Assistive Technology Shop and Laboratory and are working on setting it up. 6 CRITs, Puebla, Edo de Mexico, Guerrero, Hidalgo, Cd de Mexico, and Chihuahua. One CRIT, Chiapas, has the AT shop ready and has identified the space for the Lab and is working on setting it up. We have attached the drawings and pictures of the AT Lab and Shop for each CRIT in Appendix 2.

Table 3. Current state of space by CRIT.

CRIT	AT Lab	AT Shop
Baja California Sur	Providing services	Providing services
San Antonio	Providing services	To be determined
Chiapas	Space identified but not available yet	Space identified but not available yet
Chihuahua	Space identified but not available yet	Space identified, available and ready
Ciudad de México	Space identified but not available yet	Space identified, available and ready
Durango	Space identified and available	Space identified and available
Estado de México	Space identified but not available yet	Space identified, available and ready
Guerrero	Space identified but not available yet	Space identified, available and ready
Hidalgo	Space identified but not available yet	Space identified, available and ready
Michoacán	Space identified but not available yet	Space identified but not available yet
Puebla	Space identified but not available yet	Space identified, available and ready
Sonora	Space identified but not available yet	Space identified but not available yet

ONLINE TRAINING PROGRAM

The objective of the online program was to support the implementation of the AT shop. The training program started in November 2014 and ended in May 2015. Coursesites[3], an online free platform, was used to share the content. An example of how the content is shared in the platform can be found in Appendix 3. The training program included an introduction module and 4 modules: AT Standards, AT acquisition, Wheelchair maintenance and repair, Database and Wheelchair recycle and reuse. A total of 12 CRITs and 43 people participated in the training. There were 1 administrator, 21 therapists, 10 medical doctors, 9 technicians, and 2 engineers. After completion all participants received a completion certificate a copy of this has been attached in Appendix 4. Table 4 shows an overview of each module and its related activity. Additional details on the content of each model and activity results have been attached in Appendix 5. Links to each module and recitation meetings have been attached in Appendix 6.

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[3] www.coursesites.com

Table 4. Module overview and Activities

Title	Module Overview	Activity
AT Standards	This module introduces the concept of standards in assistive technology and gives a general overview of the International Organization for Standardization standard for wheelchairs (ISO-7176). We described, and explained different sections of the ISO 7176, including pictures and videos on how they are tested, what does the test simulates, important measures, and possible results.	Describe based on their experience with wheelchair provision what section of the standard was most important to them. In addition, they were asked to reach out to their wheelchair providers and inquire about which of their wheelchairs met ISO-7176.
AT Acquisition	This module emphasizes the importance of having different types of wheelchairs in stock so that the user can choose the wheelchair that best meets his/her needs. We presented the summary Form, which was based and translated, from the World Health Organization Wheelchair Service Training Package-Intermediate. A copy of this form has been attached in Appendix 7.	Complete a Summary Form for each wheelchair model available at their center.
Wheelchair Maintenance and Repair	This module includes: basic wheelchair repairs and maintenance, W-MAT tool, and Logistics to deliver Wheelchair Maintenance Training Program for wheelchair users and caregivers. How to perform the inspection on each component as well as the actions to take if needed were explained with a video, and pictures. We explained how to use the W-MAT with an illustrated guide. Regarding the wheelchair maintenance-training program we explained the training materials and suggested logistics for the group training.	One week before the module participants were asked to take the wheelchair maintenance knowledge based questionnaire (WMT-Q) for clinicians. Apply the W-MAT to three different used wheelchairs available at their CRIT and photo-document their findings with comments on the problems found. Comment on the use and questions on the W-MAT. Investigate the wheelchair manufacturer warranty and availability of spare parts. List 10 locally available resources for maintenance/repairs including wheelchair provider shops, bicycle shops or weld shops. Discuss the feasibility, opportunities and barriers to implement the maintenance-training program at their centers. A total of 31 participants answered the questionnaire before the training and 22 after the training. However, only 18 answered the WMT-Q before and after the training.
Database and Wheelchair Recycle and Reuse	Overview of the wheelchair reuse and recycle program that consists on objectively evaluate the wheelchair condition, and decide if it can be recycled, or if some of the components can be reused. We suggested using the W-MAT tool to evaluate the wheelchair condition. We proposed a set of files for the AT shop and laboratory to start a database.	Explore all files and comment on their relevance and usefulness and suggest how to improve them. Contact a social worker in their CRIT to explain the concept of AT reuse and recycle program, and discuss the feasibility of implementing it.

A one-on-one meeting was held with each CRIT after the online training was completed. In these meetings we discussed if the goals of the online training course were met, what the strengths, weaknesses, opportunities and threats of providing services for both the AT Lab and the AT shop were, and finally we asked for suggestions on how to improve the online training. A summary of these meetings can be found in Appendix 8. Table 5 shows a summary of the SWOT Analysis.

Table 5. SWOT Analysis

Strengths	Weaknesses
• Infrastructure and trained personnel to hold the trainings available (e.g. classrooms, etc.). • Train other staff at the centers. It is important that all understand the impact of a poorly maintained wheelchair. If a problem is identified, they are able to refer to the appropriate person. • They perceive the families they work with as receptive to learn new knowledge that will benefit their child with a disability.	• Lack of access to different types of wheelchairs for the classes. • Difficulty to schedule wheelchair users/families and trainers for group training sessions. • Not enough funding to provide wheelchair users/families with tools needed. • Unsure when they can roll out the training due to funding and logistics. They are concern that as time passes, they can forget what was learned.
Opportunities	Threats
• Raise awareness, reduce dependency, reduce costs – wheelchairs are replaced entirely instead of by failed component. • Resources for assistive technology, its maintenance and repairs are very limited. Therefore, many families could be interested in learning how to do it themselves appropriately. • For some centers the local availability of replacement parts was an opportunity to provide appropriate repair services at their center. • For one center the lack of available replacement parts was perceived as an opportunity for them to become a supplier of components for their locality. • Hold trainings off-site at communities where families can travel. • Educate wheelchair donors on the importance of wheelchair maintenance and encourage them to donate the wheelchairs with tools. • Encourage wheelchair suppliers to provide wheelchairs with tools.	• For some centers lack of locally available replacement parts was a threat to maintaining and repairing wheelchairs in a timely manner. • Income level of the families they treat. Finding funding for replacement parts and tools to allow wheelchair users and caregivers perform maintenance at home may be difficult. • Lack of accessible public transportation hinders families to travel with the wheelchair to a training site.

All CRITs found the online training useful and thorough. The online training provided them with new information about wheelchairs that they considered useful for patients and their families. They recognized the need and opportunity to implement AT services at their CRITS, and they envision incorporating them in patient scheduling as a new service.

As mentioned before, they identify as a weakness the lack of practice, and suggested an in-person training that will help to better understand the content of the training. Some CRITs suggested to do this in-person training at the Baja California Sur CRIT so that they can see how this center has implemented the AT services. Some CRITs commented that they would have liked to have more time to dedicate to the course, but due to their busy agendas they were not able to do so. There was a general concern about the lack of clarity on the administrative details (scheduling services, personnel's expectations, and budget) on how the AT shop and Lab will be implemented. They also expressed concerns in terms of the availability and affordability of assistive technology as well as wheelchair spare parts in their settings. Participants suggested adding more videos demonstrating the use of the technology, adding more information on pediatric and power wheelchairs, and including other devices such as walkers, canes and crutches, and adding training on cushion fabrication, postural supports and pressure ulcers prevention. The quality of the audio was perceived to be a barrier. Links to the recordings of each meeting can be found in Appendix 9.

COURSE EVALUATION

After the online training we asked participants to individually answer an online evaluation survey. A total of 41 participants answered the survey: 20 participated only in the AT Shop training, 21 participated in both the AT Shop and CERT training (additional AT training by the University of Pittsburgh described earlier). The survey had 46 multiple choice questions and 7 open questions for comments on what they liked/disliked and suggested improvements. The survey evaluated the general quality of the course, instructors' performance, the importance of different course components, modules, homework, course environment, course logistics, and general course perception. Table 6 presents all the results of the online course evaluation survey. More than 87 percent of the participants considered the course to be relevant for their work. Some of the things they liked the most was the content because it introduced new information and challenged their current way of thinking, especially the wheelchair maintenance and repair, and recycle and reuse content. They found it to be clear, very useful and practical. They also liked the readiness and availability of the instructor, and the opportunity to share knowledge and experience among the CRITs. The components of the online course that were ranked as most useful were the recorded presentations and the videos. The things that they liked the least about the course was that they often encountered problems with the audio, especially during the recitations and they did not have a chance to practice the theory. Some of the suggestions on how to improve the course were to improve the audio, do it in person, include information about low cost technologies, keep participants updated on new technologies, and continue with feedback and follow up. 39% found that the clarity of the homework and ease of having instructor's support for the homework was medium. More than 90% agreed that the platform (CourseSites and AdobeConnect), number of participants, and the order of the modules were appropriate. 22% felt the length of the course was too short, 29% that it was passive, 20% slow, and 12% boring.

Table 6. Online Course Evaluation Results

Section	Question	Taller (n=41)				
		VL	L	M	H	VH
Course general quality	Relevance for my work at the CRIT	0.0%	4.9%	7.3%	36.6%	51.2%
	Realism and practicality	0.0%	14.6%	19.5%	48.8%	17.1%
	Clarity and structure	0.0%	9.8%	43.9%	31.7%	14.6%
Instructor	Expositions clarity	0.0%	7.3%	31.7%	51.2%	9.8%
	Clarity of homework instructions	0.0%	4.9%	36.6%	46.3%	12.2%
	Motivational skills	0.0%	7.3%	36.6%	51.2%	4.9%
	Content Mastery	0.0%	0.0%	17.1%	41.5%	41.5%
	Ability to encourage reflection	0.0%	7.3%	22.0%	53.7%	17.1%
Importance of course components	Videos presentation of theory and concepts	0.0%	9.8%	9.8%	53.7%	26.8%
	Demonstration of the theory or skills (video, audio, written)	4.9%	9.8%	9.8%	56.1%	19.5%
	Presentation of support or reference material	0.0%	9.8%	17.1%	48.8%	24.4%
	Homework	0.0%	2.4%	39.0%	34.1%	24.4%
	Homework analysis during recitation	0.0%	14.6%	22.0%	34.1%	29.3%
Homework	Clarity in explaining what the homework is about	2.4%	2.4%	39.0%	41.5%	14.6%
	Relationship between the training received in the course, and homework complexity	0.0%	4.9%	36.6%	43.9%	14.6%
	Availability of support material to do the homework	4.9%	4.9%	31.7%	41.5%	17.1%
	Easy to have instructor support when doing the homework	2.4%	4.9%	34.1%	51.2%	7.3%

VL: Very Low, L: Low, M: Medium, H: High, VH: Very high

Section	Question	Taller (n=41)				
		TD	D	I	A	TA
Course environment	Participants have been involved and are interested in the course	0.0%	7.3%	4.9%	48.8%	39.0%
	Participants knew at all times what was expected from them	2.4%	9.8%	14.6%	51.2%	22.0%
	The participants have been able to intervene when desired	0.0%	0.0%	7.3%	46.3%	46.3%
	There was a cooperation environment during group activities	0.0%	2.4%	9.8%	41.5%	46.3%
	Participants perceived that the course activities were productive	0.0%	4.9%	19.5%	43.9%	31.7%
	Tensions and conflicts during sessions have been resolved favorably	0.0%	0.0%	12.2%	61.0%	26.8%
	The course have carried out new and innovative activities	0.0%	4.9%)	19.5%	46.3%	29.3%
	Levels of attendance have remained balanced throughout the course	0.0%	2.4%	12.2%	58.5%	26.8%

TD: Totally Disagree, D: Disagree, I: Indecisive, A: Agree, TA: Totally Agree

Section	Question	Taller (n=41)	
		A	D
Course logistics	The platform used to develop the course (CourseSites and AdobeConnect)	90.2%	9.8%
	Number of participants	92.7%	7.3%
	The course length	78.0%	22.0%
	The order of the modules	97.6%	2.4%

A: Agree, D: Disagree

Section	Question	Taller (n=41)				
		TD	D	I	A	TA
	Useful	9.8%	4.9%	7.3%	34.1%	43.9%)
	Easy	0.0%	12.2%	17.1%	58.5%	12.2%
	Enjoyable	2.4%	4.9%	17.1%	58.5%	17.1%
	Coherent	0.0%	2.4%)	24.4%	48.8%	24.4%
	Unclear	9.8%	43.9%	31.7%	12.2%	2.4%
	Valid	2.4%	2.4%	12.2%	53.7%	29.3%
	Unnecessary	53.7%	22.0%	12.2%	7.3%	4.9%
	Consistent	4.9%	4.9%	9.8%	56.1%	24.4%
Course Perception	Relevant	2.4%	2.4%	4.9%	48.8%	41.5%
	Weak	36.6%	34.1%	7.3%	17.1	4.9%
	Depth	0.0%)	12.2%	36.6%	39.0%	12.2%
	Passive	14.6%	36.6%	19.5%	22.0%	7.3%
	Reduced	9.8%	34.1%	26.8%	29.3%	0.0%
	Informative	2.4%	4.9%	7.3%	48.8%	36.6%
	Practical	2.4%	12.2%	9.8%	48.8%	26.8%
	Bored	24.4%	46.3%	17.1%	12.2%	0.0%
	Slow	17.1%	43.9%	19.5%	19.5%	0.0%

TD: Totally Disagree, D: Disagree, I: Indecisive, A: Agree, TA: Totally Agree

Examples of translated quotes of the written feedback received include:

*"*Currently wheelchair maintenance is done in a reactive manner. This training has made us aware of the importance that wheelchair maintenance has in the wheelchair user safety and wellbeing. We understood the importance of frequent inspection of the condition and function of the wheelchair and how a problem could even put the user at risk of an accident and injury. We are committed in educating our users and their families. In this way, there is a significant opportunity to implement the WMTP and educate our users to take care of their wheelchairs at home*".*

*"*We believe there is an opportunity to educate users and their families in appropriate maintenance techniques. We believe that if frequent preventive tasks are done, it is less likely that the device will fail*".*

ON SITE WORKSHOP

On August 13th an onsite workshop took place at the University of Teleton in Estado de Mexico (See Image). Two participants from each site attended. This was a 1/2 day workshop the agenda included: a 20 minutes presentation summarizing the evidence about the importance of wheelchair maintenance training for healthcare professionals, wheelchair users, and caregivers, a two-hour hands-on activity where staff of each participating CRIT received and worked with a wheelchair. They followed the manual wheelchair maintenance checklist (Appendix 10.) and physically inspected the wheelchair, wrote down the

Figure 4. In person maintenance practice

identified problems and how they could be fixed. For this activity participants also received a cleaning kit, and tools. At all times participants were involved and interested (Figure 4). After finishing the hands on activity participants were asked to give their feedback and comments about the activity, some of the comments were that they find impractical to inspect each wheelchair component by side, instead they suggested performing the inspection bilaterally. They all agree to have both the checklist and the problem reported table at the AT Shop/Lab so that they can keep track and document the wheelchair maintenance process.

Participants were asked to describe the current status on the implementation of the AT shop and Lab. All CRITs had identified the space for the AT Shop and Lab. CRIT Puebla will open the AT Shop on the first week of September. Some CRITs mentioned that they do not have the budget to implement the AT Shop but they have already identified the space. Maria Elena, Baja California's medical director, mentioned that they would soon have a meeting with CRITs' directors to address this issue. Some other CRITs have already some tools. We participants to send us pictures of the updates of the implementation of their AT Shop and Lab.

After the workshop participants were asked to answer a brief evaluation survey, a copy of the survey has been attached in Appendix 11. The majority of the participants found the workshop to be useful, relevant, easy to understand, tolerable, and enjoyable. More than half of the participants mentioned that the length of the workshop was too short. Almost 90% said that they would definitely encourage their colleagues to participate in the workshop. Finally when asked to rate the utility of the workshop, 57% rated it to be extremely useful and 39% rated it very useful. Some of the most common comments about workshop improvements were: the length they commented that it was too short, more practice in doing wheelchair repairs, not only identify the problems but actually repairing them, include power wheelchair basic maintenance, and cushion fabrication.

CONCLUSION AND FUTURE WORK

The dissemination phase of the lifelong mobility initiative was an effort to build toward the implementation of AT Laboratory and Shop among CRITs. During the online training program we provided necessary training and information, and shared knowledge and experience of what other CRITs have done. In addition we had an in-person on site workshop so that participants could practice the theory introduced in the modules. All participants were involved, interested and found the online and the on-site workshop to be useful and relevant. All participating CRITs are working towards the implementation of the AT Shop and lab. CRITs managers and directors fully support the project and encourage their teams to complete the implementation phase. Three of the pioneer centers, CRIT Guanajuato, CRIT Baja California Sur, CRIT San Antonio are already providing services at either their AT Shop and/or lab. We anticipate that all participating CRITs will have full implementation of the AT Shop and Lab with products and staffing and will provide AT services as part of the CRITs services. Their experiences and knowledge will provide valuable information to the other CRITs around the country that we expect will come on board in the implementation of the AT Shop and Lab. We encourage that the CRITs formally document the implementation process and the impact of these of the new AT services. These information should be socialized both at the national and international level. Avenues for disseminating this experience are at a professional conference and via the World Health's Organization Global Cooperation on Assistive Technology. The need to build capacity for appropriate AT devices and services is global and urgent.

Future collaboration should be explored. The University of Pittsburgh could potentially continue providing ongoing technical support and education. During this dissemination phase participants provided valuable feedback that would help to make improvements for future trainings. We expect that as all AT Shops and Labs are fully implemented and providing services, they will have all related data integrated into a database this will allow to keep track all AT services provided at each CRIT and share best practices among all CRITs. Future research collaboration could include data sharing and analysis related to AT devices provided at each CRIT. Data related to the most popular AT providers at each CRIT, particular AT needs at each CRIT, wheelchair maintenance services, and wheelchair most common failures is expected to be collected. Data analysis of this information would benefit both AT providers and users. Opportunities to collaborate with the newly formed International Society of Wheelchair Professionals could also be explored. For instance, CRIT personnel who have participated in the training could formally test their basic wheelchair provision knowledge offered by the Society. Results from this test could help identify gaps for future trainings and collaboration.

Opportunities for dissemination beyond the Teleton system in Mexico should be also considered. The need to build capacity via continuing education of rehabilitation personnel is global and encouraged via international cooperation programs and projects.

Appendix 1.

List of tools and consumables at CRIT Baja California Sur

JUEGO DE HERRAMIENTAS 263PZS CRAFTSMAN	
59 PZS CUBO DE MANDO 1/4 PLG.	
1	RATCHET
1	EXTENCION 3 PLG
11	DADOS: 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 7/16, 1/2, 9/16.
12	DADOS MILIMETRICOS: 4, 5, 5.5, 6, 7, 8, 9, 10, 11, 12, 13, 14mm.
10	DADOS 12pt: 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 7/16, 1/2, 9/16.
10	DADOS 6pt: 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 7/16, 1/2, 9/16.
11	DADOS MILIMETRICOS 6pt: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14mm.
3	DADOS TORX: T15, T20, T25.
78 PZS CUBO DE MANDO 3/8 PLG.	
1	RATCHET
2	BARRAS DE EXTENCION
1	SPARK PLUG 5/8 PLG.
11	DADOS 6pt: 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8.
17	DADOS MILIMETRICOS 6pt: 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22mm.
5	DADOS 8pt: 1/4, 5/16, 3/8, 7/16, 1/2.
11	DADOS 12pt: 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8.
12	DADOS MILIMETRICOS 12pt: 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, mm.
7	DADOS 6pt: 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4.
7	DADOS MILIMETRICOS 6pt: 12, 13, 14, 15, 16, 17, 18mm.
4	DADOS TORX: T30, T40, T45, T50.
21 PZS CUBO DE MANDO 1/2 PLG.	
1	RATCHET
1	BARRA DE EXTENCION.
9	DADOS 12pt: 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1.
10	DADOS MILIMETRICOS 12pt: 9, 10, 12, 13, 14, 15, 16, 17, 18, 19mm.
105 LLAVES Y HERRAMIENTAS ESPECIALIZADAS	
6	LLAVES ESTANDAR: 5/16, 3/8, 7/16, 1/2, 9/16, 5/8.
6	LLAVES MILIMETRICAS: 10, 12, 13, 14, 15, 17.
10	LLAVES DE COMBINACION.
1	MANGO MAGNETICO
30	BITS
12	DRIVER BITS
20	LLAVES HEXAGONALES ESTANDAR
20	LLAVES HEXAGONALES MILIMETRICAS
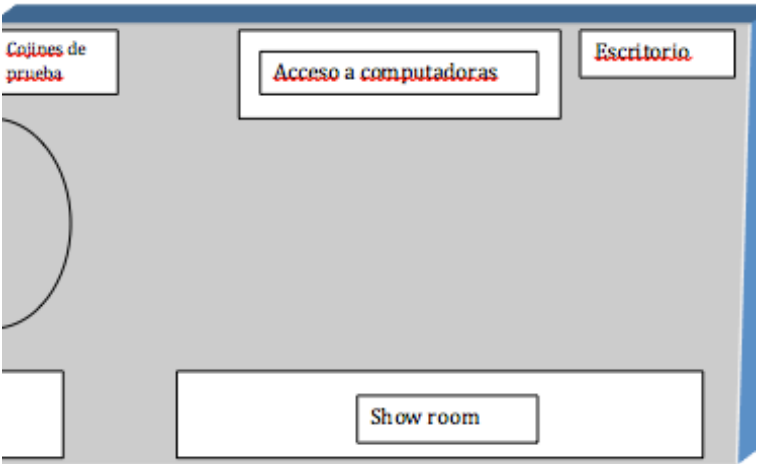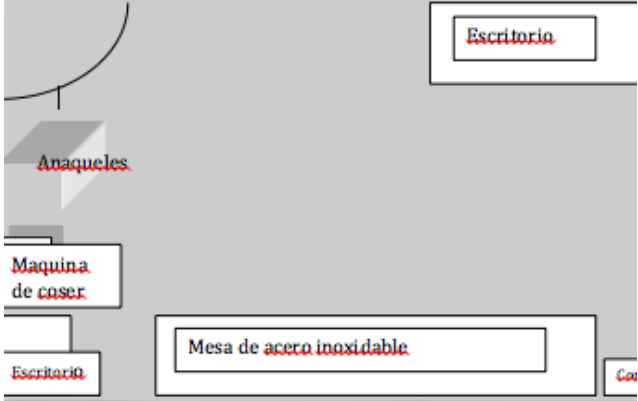
HERRAMIENTA ELECTRICA	
1	DESTORNILLADOR INALAMBRICO
	1 BATERIA RECARGABLE.
	1 CARGADOR
ACCESORIOS PARA DESTORNILLADOR INALAMBRICO	
1	ADITAMENTO DE SIERRA DE CORTE.
1	ADITAMENTO DE TALADRO PERCUTOR
1	ADITAMENTO DE SIERRA CALADORA.
1	ADITAMENTO DE DESTORNILLADOR DE IMPACTO.
1	ADITAMENTO DE REBAJADORA.
1	ADITAMENTO DE MULTIHERRAMIENTA.
1	BATERIA RECARGABLE.
1	RECTIFICADOR DE VELOCIDAD VARIABLE.
	26 ACCESORIOS
1	JUEGO PARA CORTAR 69 PZS.
	68 DISCOS DE CORTE.
	1 ADAPTADOR.
1	PISTOLA ENGRAPADORA CLAVADORA ELECTRICA

CONSUMIBLES TALLER DE ASISTENCIAS TECNOLOGICAS			
N.	**DESCRIPCION**	**INV. INICIAL**		
1	TORNILLO HEX 1/4 X 2-1/	20		
2	TORNILLO HEX 1/4 X 2	40		
3	TUERCA HEX 1/4	40		
4	UASA PLANA 1/4	40		
5	UASA PRESION 1/4	40		
6	CUELLO DE GANZO 30 cm	5		
7	PEGAMENTO AEROSOL	2		
8	PINTURA AEROSOL NEGR	4		
9	PEGAMENTO CONTACTO	1		
10	CINTA AISLANTE 3 mt	1		
11	CINTA ANTIDERRAPANTE	1		
12	LIJA P/ MADERA 220	5		
13	LIJA AGUA 320	5		
14	CINTA DOBLE CARA 5 mt	1		
15	CEMENTO PVC AZUL 472	1		
16	AFLOJA TODO WD-40	3		
17	GRASA P/ BALERO	1		
18	LIMP-MANOS ORANGE	1		
19	REMACHE 3/16X3/8	100		
20	REMACHE 5/32X1/2	50		
21	REMACHE 1/8X3/8	50		

Drawing and pictures of AT Shop and Lab per CRIT

Baja California Sur	
AT Lab	AT Shop

Chiapas
AT Space

Mueble 60 cm

Entrada

Mueble 60 cm

5.43

Ventanales

5.45
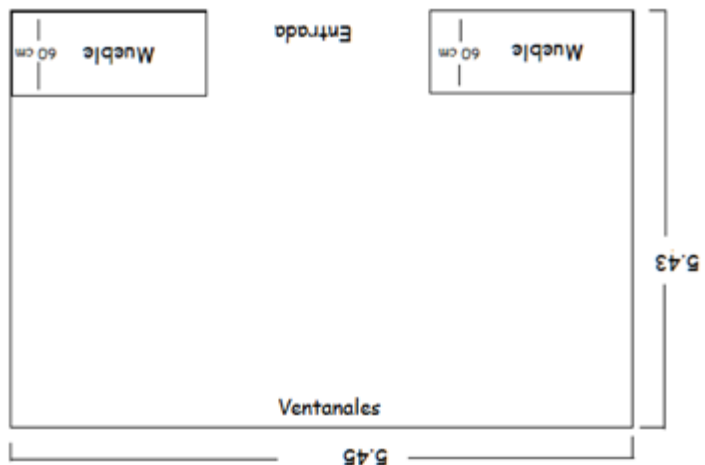
Chihuahua
AT Lab

Laboratorio de A/T

7 mts

5 mts

Computadoras

Lavabo

AT Space

Guerrero	
AT Lab	AT Shop

Hidalgo	
AT Lab	AT Shop

AT Lab

LABORATORIO AT, CUBICULO 406(TALLER DE DEPORTES) Y 407(TERAPIA OCUPACIONAL)

2.60 m　　2.60 m

| Showroom para computador | Lavabo | Lavabo | Showroom de disposi-tivo para la movilidad en el labo-ratorio AT |

AREA PARA MOVILIDAD
14.3 m2　　14.3 m2

5.50 m　　5.50 m

Computadora

1.50 m　　1.50 m
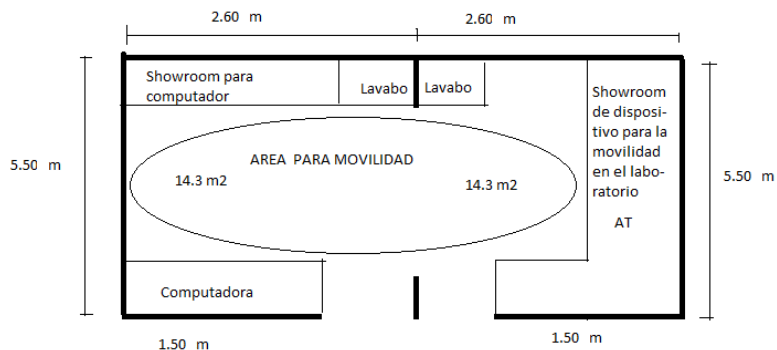
Superficie total= 28.6 mts2
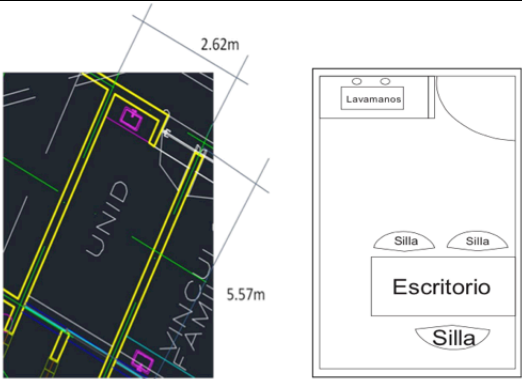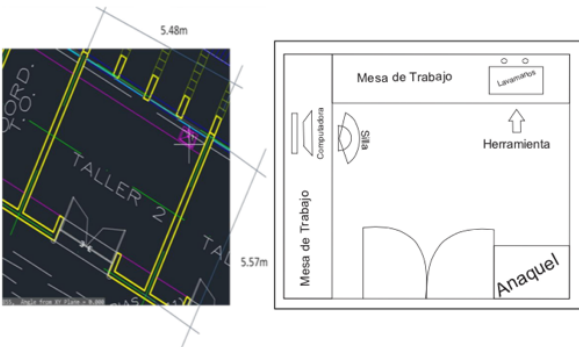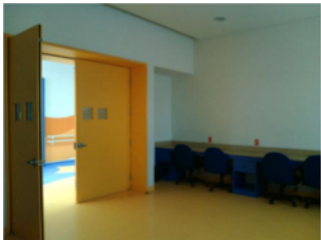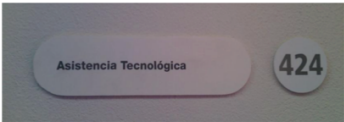
AT Shop
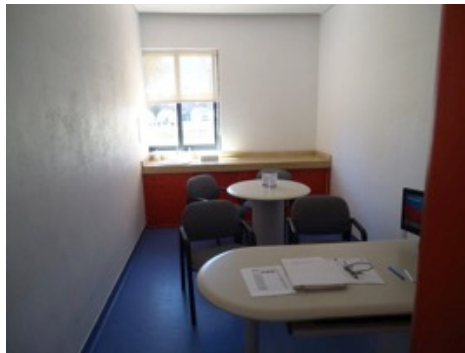
PUERTO DE SILLAS
TALLERES PARA MANTENIMIENTO Y ASISTENCIA TECNOLÓGICA

3.50 m　　5 m

Anaqueles Herramientas
A=10.5m2

Mesa de trabajo Asist. Tecnologica

Mesa de trabajo mantenimiento

2.70m

6 m　　　2.40m　　4.50 m

A=30m2

sillas

Sillas　　A=6.48m2

A=11.35 m2　　4 m

Escritorio

2 sillas

8 m

4.70 m
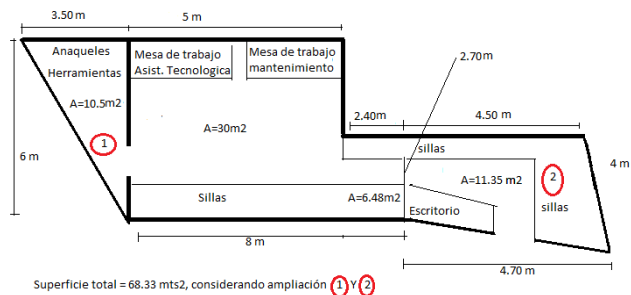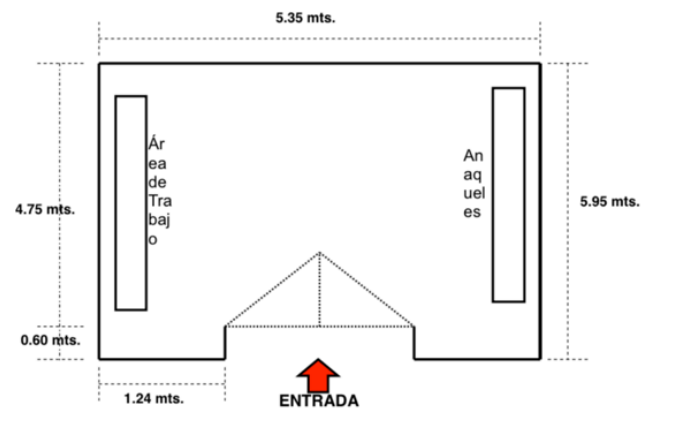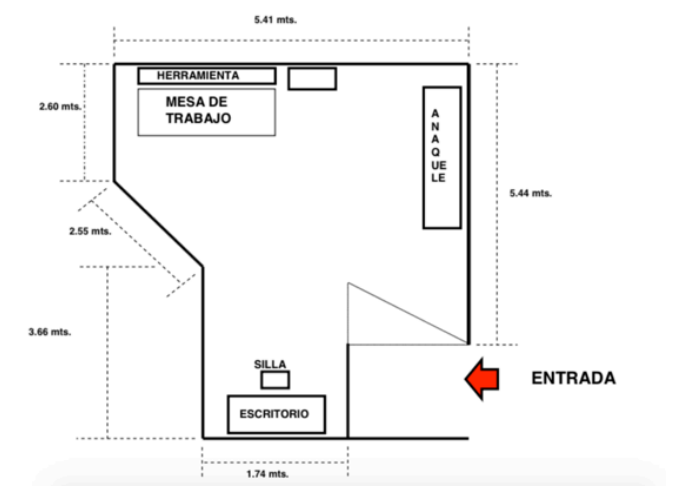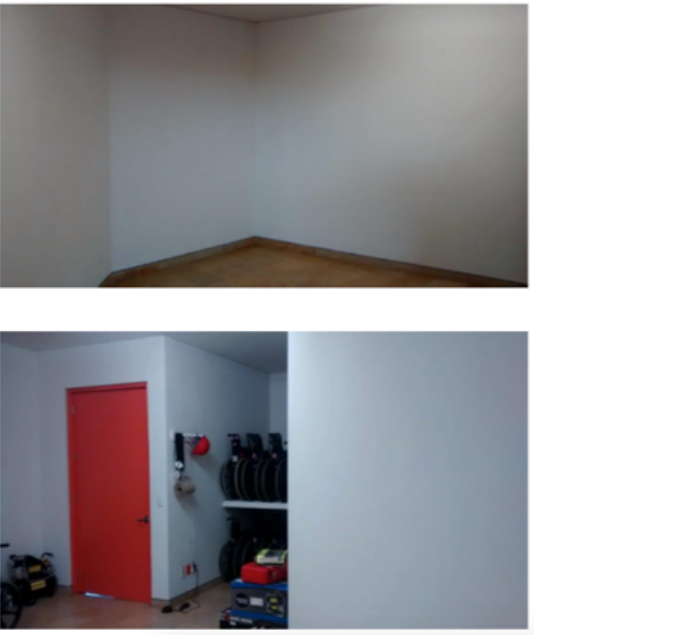
Superficie total = 68.33 mts2, considerando ampliación ① Y ②

Michoacán	
AT Lab	AT Shop

Puebla	
AT Lab	AT Shop

Sonora	
AT Lab	AT Shop

Appendix 3.

Course content presentation on CourseSites

Link to recorded lecture

Link to training materials

Clinician reference manual

Training presentation

Maintenance video

Certificate of course completion

University of Pittsburgh

School of Health and Rehabilitation Sciences
Department of Rehabilitation Science and Technology

This is to certify that

Montserrat Paredes Soto

has completed the 8.5 hours online program:

Taller de Asistencias Tecnológicas

May, 2015

_____
Jon Pearlman, PhD

Detailed module content

AT Standards

The sections presented were: Static Stability (ISO 7176-1), Determination of dimensions, mass and maneuvering space (ISO 7176-5), Measurements of sitting and wheel dimensions (ISO 7176-7), Requirements and test methods for static impact and fatigue strengths (ISO 7176-8, Resistance to ignition of upholstered parts (ISO 7176-16). We showed pictures and explained the different types of fails. We presented results of two different wheelchairs commonly used at the CRITs, OSETE and Drive Medical, both wheelchairs failed to pass the ISO 7176-8. We discussed some of the barriers to comply with the ISO 7176, and what could happen if a wheelchair does not meet the standard. Finally we encourage participants ask the manufacture to meet the minimal levels of safety and quality by complying with the standard.

Activity results

The following were the standard's sections and rationales:

Maneuverability: having a wheelchair that is maneuverable will allow the user to use the wheelchair in different location.

Durability: because the user has to be in the wheelchair most of the time, it is important that it is durable.

Dimensions: having appropriate dimensions will help ensure that the wheelchair will meet the child's needs.

Stability: important for safety so the child does not tip when reaching for objects or going over rough terrains.

Flammability: very important for the child's safety.

Interestingly, one CRIT mentioned that impact, strength, and fatigue were not a high priority to them because children outgrow the wheelchairs at a faster pace than they can break. They do not believe that the wheelchairs have to withstand high impact forces either. The majority of the suppliers answered that they were not aware of the ISO 7176. The following summarizes the findings reported by all the CRITs.

Vendor	Standard
Bertha de Osette	Does not have products that have been tested through ISO 7176.
Migo	Report that started certification process and expect to have it by the end of the year.
Ortopedicas Mostkoff	CRIO wheelchair has a European conformity certification
Vida Independiente	Most of their employees are wheelchair users and deem their wheelchairs as good quality.

AT acquisition

We discussed three sections on how to evaluate a wheelchair when deciding which one to buy: 1. Functional Performance, 2. Postural Support 3. Strength, Durability and Safety. We showed how different wheelchair characteristics could impact user performance. Regarding functional performance we mentioned ways to improve wheelchair stability, maneuverability, ability to transfer, considerations in transporting a wheelchair, and reliability. We included pictures to explain the adjustments that can be done, and showed examples of wheelchairs commonly used at the CRITs that provide this adjustability. Regarding Postural Support we talked about different types of seats, cushions, backrest, postural supports, footrests, armrests and seatbelts. Pictures and examples of wheelchairs with different postural supports were included. Finally regarding the strength, durability and safety we mentioned the importance of complying with ISO standards.

Activity results

CRITs reported to have wheelchairs from 8 different manufacturers: Vida Independiente, Roe Mexico, Rehabimedic, Ortopedica Mostkoff, MIGO, Kabal, INTCO, Drive, Bertha O de Osete. They reported to have 24 different wheelchair models. Of these different models, 21 wheelchairs had upholstery back and seat, 10 wheelchairs had no cushion, 14 wheelchairs had foam cushions, 20 wheelchairs had solid casters, and 4 wheelchairs had pneumatic casters. 21 wheelchairs had pneumatic tires, and only 3 had solid tires. 3 wheelchairs had postural supports, and only one wheelchair had adjustability in its components. The lightest chair was 20lbs and the heaviest chair was 41lbs with an average weight of 35 lbs. A summary of the different wheelchairs and its characteristics was shared with all participants.

Wheelchair Maintenance and Repairs

Regarding basic wheelchair repairs and maintenance we explained the importance of performing periodic inspections and maintenance and cleaning on different wheelchair components

The W-MAT tool was designed to objectively evaluate the condition of a wheelchair. This part of the module explains how to use this tool that is a checklist that consists of three sections: postural supports, wheelchair frame and accessories, and wheels. Each section contains different wheelchair items to be evaluated. We included an illustrated guide. The wheelchair maintenance-training program is designed to be completed in two days, with a theory part using a power point presentation that explains how to inspect and maintain each wheelchair component, and a hands on part where attendants can practice.

Activity results

Some of failures reported were: rusted, wore out parts (frame, screws), missing parts, sagged and ripped upholstery, and worn wheels and casters.

Example of pictures provided in the W-MAT. Left: missing foot support. Right: Worn tire and brake does not work.

In general all participants found the W-MAT to be a useful, practical and thorough. They expressed their concerns about liability when repairing a wheelchair. They suggested adding sections including tilt in space, the use of a positioning cushion that they called "PETO" and seatbelts. Some participants commented that the W-MAT is very extensive and that it took a lot of time to apply it, however, they realized that with practice the time decreased. Participants were asked to comment on how the W-MAT information can be handled (e.g. only with the shop personnel, or also with the user). Several CRITs commented that it would be very useful to share this information with the user/caregiver because it would facilitate the long-term follow-up. One CRIT suggested to use an adapted W-MAT for each different user depending on their type of wheelchair.

Among the 11 centers a total of eight wheelchair suppliers were identified. Their products warranty ranged from 6 months to 3 years. Four of the suppliers sold replacement parts and components. The following summarizes the findings reported.

They reported: 33 bicycle workshops, 5 welding shops, 17 orthopaedic stores, 4 tire changing shops, 3 wheelchair repair shops, and 1 mattress manufacturer. Some CRITs commented that a tailor shop could also be a resource to maintain the wheelchair upholstery.

Almost all participants commented that it could be possible to implement the maintenance training program at their CRIT and that it would be very convenient and useful for their patients. They mentioned that there are classrooms and staff available in each center to provide the training. One CRIT already provides users with a printed maintenance program. They also commented on the importance of training different staff members. Some of the participants see the lack of outside maintenance services as an opportunity, while others see it as a barrier. Participants identified different barriers, such as difficulty to schedule the maintenance service, difficulty for users to bring their wheelchair to the center due to lack of accessible transportation, not enough spare parts, tools and wheelchairs to do the training. Some suggestions were to provide the training outside the center near patients' addresses They mentioned the need of having more information about pediatric and power wheelchairs, and having the training program translated to different dialects.

After the online meeting, information about tilt- in space, security belt, and positioning cushion ¨PETO¨ were added to the training program.

Database and reuse/recycle

The reuse and recycle program could be beneficial for CRITSs´ clients and could extend the wheelchair lifecycle.

We presented a color- coding control for each component depending on its evaluation and condition.

Regarding data management, we introduced different files to start a database. Files for the AT Laboratory included: "Resumen silla de ruedas" taken from the World Health Organization forms and checklists from the Wheelchair Service Training Package, "Valoracion AT" taken from CRIT Baja California Sur, and "Seguimiento AT". Files for the AT shop

included: W-MAT, "Inventario Sillas, partes y materiales". This suggested database contains patient information, AT service information, and the AT inventory.

File	Suggestion
"Valoracion AT"	Add information about leisure activities, learning channels and attention span, AT used at school, and body control details, for example head, hand, feet control.
"Seguimiento AT"	It could be used as a tool to evaluate the lab services performance and results. They suggested to include information about AT availability, and pressure ulcers warning signs.
"Resumen de SR"	Add information about the positioning cushion "PETO".
W-MAT	It could send reminders.
"Inventario de Sillas, partes y materiales"	Add information about the wheelchair provider. One CRIT commented that they already used a color-coding similar to the one included in the module.
"Service Taller y excel"	Add information about parts that they foresee will fail soon so that parents and caregiver could anticipate and plan on changing, or purchasing the part.

Social workers reported that it is common to find abandoned AT devices and equipment at patients' school and home. They commented that it is also common to find abandoned orthesis and splints, and that they believe that this can be prevented with an appropriate prescription. Some of the causes for abandonment were: The user outgrows the wheelchair and it does not longer satisfy their needs, the wheelchair does not meet user positioning needs, user does not know how to use AT, wheelchair is too heavy, it is difficult to transport the wheelchair due to lack of accessibility in public transportation, sometimes the wheelchairs are broken and parents do not know how to repair them, and they are not interested in maintaining the wheelchair. In general social workers expressed that bringing the abandoned AT devices back to the CRIT would be difficult and not feasible because: families may not be willing to donate it, sometimes the family does not own the AT, it is not allowed, it is not in their job description as social workers, it will be difficult to transport the equipment back to the center, and finally there may not be enough space in the CRIT to store the equipment. Although almost everybody said that it is not feasible, they suggested ways to do it.

Modules and recitations links

Module	Link
Introduction	Module: https://pittrstce.adobeconnect.com/p7u7jysfcq7/
AT Standards	Module: https://pittrstce.adobeconnect.com/p49jdjqbvc3/?launcher=false&fcsContent=true&pbMode=normal Recitation Link: https://pittrstce.adobeconnect.com/p6x8u9bawax/
AT Acquisition	Module: https://pittrstce.adobeconnect.com/p2fymmti93v/?launcher=false&fcsContent=true&pbMode=normal Recitation Link https://pittrstce.adobeconnect.com/p893ljr0roo/
Wheelchair Maintenance and Repair	Module: https://pittrstce.adobeconnect.com/p7tuvyap6mu/?launcher=false&fcsContent=true&pbMode=normal https://pittrstce.adobeconnect.com/p6pswmdotqd/?launcher=false&fcsContent=true&pbMode=normal https://pittrstce.adobeconnect.com/p2sdadxbh1c/?launcher=false&fcsContent=true&pbMode=normal https://pittrstce.adobeconnect.com/p2sdadxbh1c/?launcher=false&fcsContent=true&pbMode=normal Recitation Link https://pittrstce.adobeconnect.com/p40bnttmg9d/?launcher=false&fcsContent=true&pbMode=normal
Database and Wheelchair Recycle and Reuse	Module: https://pittrstce.adobeconnect.com/p1e19qmutbg/?launcher=false&fcsContent=true&pbMode=normal Recitation Link **https://pittrstce.adobeconnect.com/p6myvcufu9m/**

Wheelchair Summary Form

Forma Resumen Silla de Ruedas

Traducido de Wheelchair Summary Form del World Health Organization Wheelchair Service Training Package - Intermediate

Nombre de la Silla		*Foto*
Fabricante/Proveedor		
Tamaños Disponibles		
Peso Total de la Silla		

Descripción

Marco:	Rígido	☐	Plegable	☐	Longitud del marco:		
Respaldo:	Tapicería	☐	Rígido	☐	Tensión Ajustable	☐	
Asiento:	Tapicería	☐	Rígido	☐	Tensión Ajustable	☐	
Cojín:	Sin Cojín	☐	Hule espuma	☐	Hule Conformado	☐	
	Gel	☐	Aire	☐	Otro	☐	
Apoya pies:	Fijo	☐	Removibles	☐	Otro:		
Ruedas Delanteras:	Neumática	☐	Diámetro:				
	Maciza	☐	Ancho:				
Ruedas Traseras:	Neumática	☐	Diámetro:		Aros propulsores	☐	
	Maciza	☐	Ancho:		Eje ajustable	☐	
	Injerto	☐			Removible	☐	
Frenos:	Palanca Corta	☐	Palanca Larga	☐	Otro:		
Apoya brazos:	Curveado	☐	Cuadrado	☐	Otro:		
	Fijo	☐	Removible	☐	Otro:		
Mangos de empuje	Mangos de Empuje	☐					
Apoyos Posturales:	Estabilizador de Cadera	☐	Apoya Pantorrillas	☐	Soporte para los hombros	☐	
	Estabilizador de pies	☐	Ruedas anti volcamiento	☐	Soportes laterales para el tronco	☐	
	Mesa	☐	Soporte para Cabeza	☐	Soporte pélvico	☐	
	Otros:						

Mediciones, opciones de ajuste y rangos de ajuste:

	Medidas *(Si la silla está disponible en diferentes tamaños, enumere todos los tamaños)*	¿Es ajustable?		Rango de Ajuste *(Rango de ajuste disponible para esta silla)*
		Sí	No	
Ancho del asiento		☐	☐	
Profundidad del asiento		☐	☐	
Altura del asiento		☐	☐	
Altura del respaldo		☐	☐	
Reclinación del respaldo		☐	☐	
Altura de los apoya pies		☐	☐	
Angulo de los apoya pies		☐	☐	
Altura de los mangos de empuje		☐	☐	
Longitud del marco		☐	☐	
Longitud de la base		☐	☐	
Angulo del asiento al respaldo		☐	☐	
Basculación		☐	☐	

Requisitos relacionados con resistencia y durabilidad para sillas de ruedas manuales

Tomado de Pautas para el suministro de sillas de ruedas manuales en entornos de menos recursos de la Organización Mundial de la Salud

Pieza	Necesidad de Resistencia, Durabilidad y Seguridad	
Apoya Pies	Los apoya pies deben plegarse con una cantidad razonable de fuerza.	☐
	Los apoya pies no deben romperse ni doblarse si se les usa para levantar a la silla de ruedas con el usuario en ella.	☐
	Los apoya pies no deben romperse ni doblarse si se carga a más pasajeros o bultos.	☐
	Los apoya pies no deben romperse ni doblarse si choca con un objeto como, por ejemplo, una pared o un andén.	☐
Frenos	Los frenos deben impedir que la silla de ruedas resbale en una pendiente.	☐
	Los frenos no deben soltarse súbitamente mientras están en uso.	☐
Apoya Brazos	Debe poder retirar el apoya brazo con una cantidad razonable de fuerza.	☐
	El apoya brazo no debe romperse ni doblarse con el peso del usuario.	☐
	El apoya brazo no debe romperse ni doblarse si se usa para levantar a la silla de ruedas con el usuario en ella.	☐
Mangos de empuje	Los mangos de empuje no deben romperse ni doblarse si se las usa para levantar a la silla de ruedas con el usuario en ella.	☐
	El hule del mango no debe deslizarse de los mangos de empuje cuando se ayuda al usuario a subir una escalera o un andén.	☐
Marco	El marco no debe romperse ni doblarse si se usa en terreno disparejo.	☐
Respaldo y asiento	Respaldo, asiento y marco no deben romperse ni doblarse durante traslados ni en recorridos por terreno disparejo.	☐
Rueda trasera eje y marco	Ruedas y ejes no deben romperse ni doblarse cuando el usuario pasa por encima de un andén.	☐
	Ejes o soportes de ruedas no deben fallar cuando el usuario baje de un andén en diagonal.	☐
	Ejes o soportes de ruedas no deben romperse ni doblarse bajo esfuerzos típicos.	☐
Conjunto de rueda delanteras	No debe fallar si la rueda delantera choca con algo (p. ej. Un andén).	☐
Generalidades	Las superficies no deben tener bordes filosos, puntas agudas ni lugares que pellizquen.	☐
	La silla de ruedas no debe ser inflamable, esto es, no se debe usar materiales combustibles.	☐
	Las sillas de ruedas deben llevar adhesivos reflectantes adelante y atrás para mayor seguridad en la calle.	☐
Varios	Las palancas basculantes no deben romperse cuando el asistente las usa para inclinar al usuario hacia atrás.	☐
	Los aros propulsores no deben romperse cuando se golpea contra algo.	☐
	La silla de ruedas no debe romperse si se cae o si el asistente la deja caer al cargarla o descargarla en un camión o automóvil.	☐
Prueba de fatiga	La silla de rueda no debe romperse en uso normal.	☐

Comentarios:

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SWOT analysis in detail

CRIT	General objectives Cert/Taller met?	SWOT Analysis				Suggestions for courses
		Strengths	**Weaknesses**	**Opportunities**	**Threats**	
Durango	Lab an Taller identified but not ready	Planning for AT showroom. Spaces are assigned. Cert/Taller training.	The person in charge of Taller was not identified so wasn´t trained. Focused on CARF accreditation process that took all their time. Feel that they are not ready to train users. Implementation steps are unknown: time/logistics/scheduling.	Learn from BCS.	Access to AAC. Funding for AT	Need more practical in-person experience. Add more: Videos demonstrating the technology – like the audition presentation. Pediatric info. Other AAC alternatives. AT relevant/available to their context and language. Other mobility AT: canes, crutches, etc. P&O was too broad. Needs to be more contexts appropriate. Case/module. Activities: propose 2 solutions, one from the lecture and another from a low cost or locally available AT.
Michoacán	Taller space identified but waiting for roof. Lab identified and getting ready.	Already do AT provision but with the training they will do a better and follow up. Since they are a new CRIT they adapt quickly to changes and new procedures.	Unsure who will be in charge. Unsure of official procedures for the new AT service. Not at the system's level yet. Purchase committee takes too long.	The need to implement AT services.	Funding from administration for this initiative. Several of other project's funding was cut.	More info: For Taller personal home modifications and basic accessibility. English was a barrier. Add more homework that requires practice. For example: do x maintenance and repairs. Both courses require more hands-on practice.

Puebla	Taller – ready Lab – identified but not ready	Space identified, materials ready, personnel identified. Motivation and commitment. Interdisciplinary team. The person from Puerto has more experience and will train others.	Don't have practical experience. Don't have the AT. Not enough expertise yet with the AT to be able to teach their clients.	Teach other professionals at the CRIT. Teach users. – 70% are wheelchair users.	Funding for AT.	More info on: Visual impairment. More videos with real solutions/examples. Give guidance on how to acquire basic AT. They need to have access to it to be able to practice and understand better the lectures. Ask them to provide solution for the case studies with technology locally available and if there isn't then propose another solution. Too much work both Cert and Taller. Stager.
Estado de México	Lab identified but not ready and Taller ready	Already do low cost AT.	Theory OK but all to be learned in practice. Lack of tools. Unsure when the implementation is starting. Unsure with implementation logistics (agenda, personnel)	Lots of wheelchair users that have been identified as beneficiaries of the Taller.	Funding and budget. Unclear when it will start, if a lot of time passes after this training, they will forget all. Their clients are very poor.	More info: Low cost/ DIY AT AT cost How to acquire AT Start Taller at the same time as Cert. Case studies closer to their reality, more pediatrics.

Sonora	Lab and Taller identified but not ready	Funding allocated to adapt the spaces. Cert/Taller training Taller is 60% equipped. Motivated interdisciplinary personnel. Users are excited with the initiative.	Implementation logistics not certain. Need a person full time for this and it takes time to create the position. They are very busy, have many needs. Most wks. are hospital style donated. Lack of experience. Focused on accreditation and were very busy with that. Expected number of services to be provided unknown.	Add new WC eval service in their scheduling system. Through the homework they identified local suppliers that didn't know existed. Learn from BCS. AT to become a system-level new service/procedure.	99% of their clients are low income. AT Funding/Access/availability Funding for the new service. If there is no follow up to the initiative/training it will not fall through.	More info: Local products, DIY AT. How the AT functions, videos with AT in use. Practical experience. BCS experience. At least Spanish subtitles. Wheelchair repairs. Wheelchair measurement videos. All parties to participate from both Cert and Taller training. More diagnosis info for cases because of prognosis (e.g. future education/employment). A module every 2 weeks.
Guerrero	Taller – ready Lab – identified but not ready	Motivation Cert/Taller training received.	Not clear policy/procedures/funding for the new AT service. Who/how Lack of funding for AT for showroom	Many users have new WCs. Start with maintenance service since the Taller is ready.	Public transportation is not accessible. Lack of access to spare parts	Add more: pediatric cases, AAC info, Audiology info, do site visit to BCS and see how they do it. Hans-on/practice training.

Chiapas	Lab not yet, a small taller but not all tools	Cert/Taller training increased their awareness. They do low cost: cushions, switches, communication boards, toys. Took previous training with Olmán Vargas OT de la fundación redes.	Infrastructure, budget – can become an opportunity for next year. Only donate hospital-style chairs usually very big (20 or 22")	Maintenance useful for parents. Train parents Maintenance cards can be translated to other dialects. Add new service for 2016. AT is a big need in their population.	Funding. They have to wait for next year's budget. Lack of access to spare parts locally. Rough/inaccessible terrain. WCs and AT will fail quicker. Their users are very poor.	More hands-on practice. Modules and recitations every two weeks. More info: Cushion fabrication AAC – low cost/Spanish. Low cost, DIY AT Videos with AT in use For case study answer one commercially available device and a low cost or DIY solution. More discussion: boards/meetings/voice/listserv More info on policy: have them study their current public policies related to AT. Help them build a referral network for AT: foundations/ngos/suppliers/funding/etc.
Hidalgo	Taller ready Lab working on it	Showroom requirements listed. Motivated interdisciplinary team.	Focused on 2 certification processes right now. Not sure what the expectations are from the managers.	Working on structured work plan. Even if access to AT is limited, the training gives the info to do better with what they have. Train more employees and other CRITs Train and empower users.	Funding, they have no extra budget for this. Purchase department is in charge of getting the supplies. They are overworked. Lack of suppliers. Attitudinal barriers towards disability as well as asistencialism. Users might be resistant to be asked to take care of their wheelchairs.	Have all take both Cert and Taller. Specially the MDs since they lead all the interventions. They need to be aware of all the info so they can see the big picture.

Cd. México	Taller – ready Lab – identified but not ready	Plan to move forward in place		They buy the spare parts and repair the WCs	Few AT suppliers and do not meet with ISO.	More info: Taller was too short. Hands on experience
Baja California	Implemented and providing services			High demand for the AT services, both Lab and Taller.	Felt that other CRITs were confused in terms of who and how the AT services are going to be implemented	Increased communication with instructors and less language barriers. More info and practice on the W-MAT Taller and Cert: make them one training or completely separate them. Taller: more info on how to build cushions and materials for cushion fabrication. More info on more advance postural supports. Taller personnel should receive some Cert training: pressure ulcers, technology type. WHO posters are useful for this.
Chihuahua	Taller – ready Lab – identified but not ready		Patients live far away where there is no infrastructure.	Texas is very close so they can bring stuff from the US.	AT supply in general is scarce	

Links to one-on-one meeting recordings

Guerrero: https://iswp.adobeconnect.com/p81anhtbtu8/

Durango: https://iswp.adobeconnect.com/p6vgv2ozyop/

Sonora: https://iswp.adobeconnect.com/p3hvv86rbuk/

Puebla: https://iswp.adobeconnect.com/p3ggtic1xqd/

Ciudad de México: https://iswp.adobeconnect.com/p4sob1vn7ti/

Estado de México: https://iswp.adobeconnect.com/p6cojddpwjq/

Hidalgo: https://iswp.adobeconnect.com/p85jsfe4n3r/

Chiapas: https://iswp.adobeconnect.com/p9fzh1h2m6p/

Michoacán: platform failed, not recording available

Baja California Sur: https://iswp.adobeconnect.com/p1l48uvvop2/

Chihuahua: https://iswp.adobeconnect.com/p9u5x0dyop6/

Wheelchair Maintenance Checklist

RECUERDE DE COMPROBAR TODA LA TORNILLERÍA EN LOS COMPONENTES QUE APLIQUE

Actividades de mantenimiento	Actividad realizada	Seleccione si no aplica	Frecuencia
Lado derecho			
Revise el apoya brazos derecho	☐	☐	**Mensual**
Revise el protector de la ropa derecho	☐	☐	**Mensual**
Revise la llanta derecha	☐	☐	**Mensual**
Si las llantas son neumáticas, **revise** la presión de la llanta derecha	☐	☐	**Semanal**
Revise el freno de la rueda trasera derecha	☐	☐	**Mensual**
Revise los rayos de la rueda trasera derecho y si la rueda está alineada	☐	☐	**Mensual**
Revise el aro propulsor derecho	☐	☐	**Mensual**
Revise el eje derecho	☐	☐	**Mensual**
Limpie y lubrique el eje derecho	☐	☐	**Mensual**
Revise el rodamiento de la rueda trasera derecha	☐	☐	**Mensual**
Limpie el lado derecho del marco de la silla de ruedas	☐	☐	**Mensual**
Revise el lado derecho del marco de la silla de ruedas	☐	☐	**Mensual**
Lado frontal			
Revise los apoya pies	☐	☐	**Mensual**
Revise las ruedas delanteras	☐	☐	**Mensual**
Revise los rodamientos de las ruedas delanteras	☐	☐	**Mensual**
Limpie los ejes de las ruedas delanteras	☐	☐	**Mensual**
Revise el cojín y el forro del cojín	☐	☐	**Semanal**
Limpie el cojín y el forro del cojín	☐	☐	**Mensual**
Revise la tapicería del asiento	☐	☐	**Mensual**
Limpie la tapicería del asiento	☐	☐	**Mensual**
Revise el cinturón de seguridad	☐	☐	**Mensual**

Continua al reverso

Actividades de mantenimiento	Actividad realizada	Seleccione si no aplica	Frecuencia
Lado izquierdo			
Revise el apoya brazos izquierdo	☐	☐	**Mensual**
Revise el protector de la ropa izquierdo	☐	☐	**Mensual**
Revise la llanta izquierda	☐	☐	**Mensual**
Si las llantas neumáticas, **revise** la presión de la llanta izquierda	☐	☐	**Semanal**
Revise el freno de la rueda trasera izquierda	☐	☐	**Mensual**
Revise los rayos de la rueda trasera izquierda y si la rueda está alineada	☐	☐	**Mensual**
Revise el aro propulsor de la rueda trasera izquierda	☐	☐	**Mensual**
Revise el eje de la rueda trasera izquierda	☐	☐	**Mensual**
Limpie y lubrique el eje de la rueda trasera izquierda	☐	☐	**Mensual**
Revise el rodamiento de la rueda trasera izquierda	☐	☐	**Mensual**
Limpie el lado derecho del marco de la silla de ruedas	☐	☐	**Mensual**
Revise el lado derecho del marco de la silla de ruedas	☐	☐	**Mensual**
Lado posterior			
Revise los mangos de empuje	☐	☐	**Mensual**
Revise las ruedas anti volcamiento	☐	☐	**Mensual**
Revise los tubos del respaldo y soporte del respaldo	☐	☐	**Mensual**
Revise la tapiceria del respaldo	☐	☐	**Mensual**
Limpie el respaldo	☐	☐	**Mensual**
Revise el mecanismo de tijera	☐	☐	**Mensual**
Revise el mecanismo de basculación	☐	☐	**Semanal**
Revise la suspensión	☐	☐	**Mensual**

In-person workshop evaluation form

Fecha de la sesión: Agosto 13, 2015

Lugar: Ciudad de México

Te presentamos una relación de adjetivos con los que podemos calificar el curso de mantenimiento de sillas de ruedas. Te pedimos que marques con una cruz (X) en el espacio que mejor exprese tu valoración global del curso:

El curso me pareció	Muy en desacuerdo ☹	Algo en desacuerdo	Ni de acuerdo ni en desacuerdo	Algo en acuerdo	Muy de acuerdo ☺
	1	**2**	**3**	**4**	**5**
Útil					
Relevante					
tolerable					
Entendible					
disfrutable					

Duración del curso (seleccione una):

Muy corto _____   adecuado _____   muy largo _____

Por favor conteste las siguientes preguntas de opción múltiple:

1. **¿Motivaría a sus colegas a participar en este curso?**
    a.   Definitivamente sí
    b.   Probablemente sí
    c.   No estoy seguro/a
    d.   Probablemente no
    e.   Definitivamente no

2. **¿Cómo calificaría la utilidad de este curso para su práctica profesional?**
    a.   Extremadamente útil
    b.   Muy útil
    c.   Moderadamente útil
    d.   Un poco útil
    e.   Para nada útil

Por favor describe cualquier recomendación que tengas para mejorar este curso

_____

_____

_____

Su opinión es muy importante para nosotros. ¡Muchas gracias!