

Final Report

IPRO 309: Educational and Technical Support of Orthotics and Prosthetics Education in Latin America and the US

1. Introduction

The objective of IPRO 309 was the creation of educational modules in continuing support of the orthotics and prosthetics (O&P) technician training program currently being established at Centro Don Bosco in Bogota, Colombia, as well as a similar program at Joliet Junior College in Joliet, Illinois. This IPRO continues the work of four previous semesters, and added to the preexisting modules by creating new work covering topics specific to the O&P needs of the ~~adult, geriatric, and pediatric~~ pediatric, adult, and geriatric populations.

All project materials will be translated into Spanish including brochures, presentations, and the project webpage. These translated materials, as well as ~~original the~~ English materials ~~versions~~, will be provided to both educational institutions in furtherance of their O-&P programs and the cooperative efforts with them.

2. Background

There are over 45 million people living throughout Latin America (CIA World Fact Book, 2008). Approximately 250,000 of ~~those~~ these people have unmet needs in the area of orthotic and prosthetic care. With an estimated 50 certified O&P practitioners and 1500 uncertified practitioners, these statistics show the need for additional accredited O&P technician programs in Latin America. Several institutions have joined to provide education and care to those in need; these institutions are listed below:

- Universidad de los Andes; Bogotá, Colombia
- La Escuela Colombiana de Rehabilitación; Bogotá, Colombia
- Centro Don Bosco, Bogotá; Colombia
- Laboratorio Gilete, Bogotá; Colombia
- Bioconcepts, Inc.; Burr Ridge, IL
- Dynamic Orthotics and Prosthetics; Houston, TX
- Children's Memorial Hospital; Chicago, IL
- Joliet Junior College Tech Prep Program; Joliet, IL
- Northwestern University Prosthetics and Orthotics Center; Chicago, IL
- Illinois Institute of Technology, Chicago, IL

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In October of 2004 Centro Don Bosco (Bogotá, Colombia), Don Bosco University (San Salvador, El Salvador), and the Laboratorio Gilete (Bogotá, Colombia) signed an agreement to establish the first accredited O-&P education program in Colombia. Since then, Centro Don Bosco has allotted 3500 square feet of space to the program, begun construction on classroom and laboratories in that space, and hired faculty and staff to support the program. Along with their vocational workspace, this allows for the classroom and manufacturing training required for a Category ~~3~~ III program.

Now that the program has been started there is a need to accredit the program by ISPO standards.

3. Purpose

IPRO 309 had as its objectives the ~~development~~ generation of educational modules that will aid in the development and accreditation of an ISPO Category ~~Three-III~~ training program. The Category ~~Three-III~~ program trains ~~Orthotists-orthotists~~ and ~~Prosthetists-prosthetists~~ who will be able to ~~construct-fabricate~~ devices to improve the quality of life of patients. The modules will be implemented in Bogotá, Colombia at Centro Don Bosco High School, and at Joliet Junior College in the United States. These are hands-on, interactive sessions that can be used as learning and review material in the subject of the biomechanics of human motions. The group was divided into sub-teams to cover the primary stages, or age groups, of human development: pediatric, adult, and geriatric.

Accrediting the program will allow the students to further their careers; after a student has received Category ~~3-III~~ certification from an accredited institution, the student can also receive a Category ~~2-II~~ certificate, with enough experience. A Category ~~3-III~~ practitioner cannot treat patients; by receiving the Category ~~2-II~~ certificate the practitioner will then be able to work directly with the patients and more patients can be ~~helped-treated~~ in a shorter amount of time.

Most importantly, Centro Don Bosco has students who are interested in the program. The first class began in February of 2005 with 17 students. The impact these students have will be irreplaceable; in one year, the students will collectively produce over 200 orthotic and prosthetic devices. As a result, the first graduating class will affect a total of over 100,000 patients throughout their careers.

Although the accreditation of the program in Colombia is the main effort, the IPRO team's work will serve multiple purposes. The educational modules will also be provided to ~~the~~ Joliet Junior College (JJC), which is also establishing an O-&P training program. Many of the students at JJC speak Spanish natively, which further emphasizes the need to translate all educational materials. The equivalent accrediting body to ISPO in the United States is called the American Board of Certification in Orthotics and Prosthetics (ABC), and it is independent of ISPO. As regards ~~to~~ the program at JJC, these separate accreditation guidelines must be taken into account.

4. Research Methodology

To assist in the accreditation process, IPRO 309 students created educational modules to be used for the classroom portion of the educational program at Centro Don Bosco. Previous IPRO groups have focused on biomechanics, pathologies, common O-&P devices, and medical conditions. This semester, research continued on common medical conditions and the orthotic devices used to treat them. The educational modules created this semester covered non-surgical treatments for multiple pathologies and divided those pathologies by age: pediatric, adult and geriatric. These educational modules are translated into Spanish so they can be used by the faculty and students

at Joliet Junior College as well as Centro Don Bosco. These modules will be reviewed by practitioners in the industry to provide feedback and advice to ensure the information will help improve the program.

Three subgroups ~~have been~~were created to research and compile the educational modules. Each group created computer presentations as well as pamphlets to effectively convey their research in a way that will be easily incorporated into the lesson plans of teachers at Centro Don Bosco and Joliet Junior College. Each individual group delegated their tasks and created a work breakdown structure that would allow the effective completion of the educational modules.

5. Assignments

Project team member assignments have not altered since the midterm report with the exception the removal of the as Assessment Tools Developer position. The revised list of team assignments is below.

- *Project Manager*: Emily Moore. The project manager oversaw all of the operations as well as announced daily meeting agendas. The project manager also ensured all administrative tasks were being taken care of as well as informed team members of deliverable deadlines.
- *Project Content Manager*: Seth Buntain. The content project manager oversaw the production of the educational materials as well as instructed subgroups on what is expected of them for each deliverable. The content manager also ensured all deliverables are submitted on time.
- *Webmaster*: Lydia Benger. The webmaster created a website to make all educational materials available to the public in English and Spanish.
- *Vocabulary Manager*: Marisa De Nicolo. The vocabulary manager compiled the pertinent vocabulary from each of the three subgroups into one easy-to-use note sheet.
- *Minutes Recorder*: Heather Selby. The minutes recorder recorded all group discussions at the meetings as well as posted any deadlines that have been decided upon on iGroups.
- *Poster Designer*: Stefanie Rozborski & Heather Selby. The poster designers will created the poster for IPRO Day and collected all pertinent information from each subgroup.
- *Time Sheet Coordinator*: Stefanie Rozborski. The time sheet coordinator was charged with tracking team member timesheets.
- *Work Schedule Specialist*: Robert LaRue. The work schedule specialist managed the team's work breakdown structures and progress.
- *International Conference Coordinator*: Ross Allen. The international conference coordinator was responsible for the planning all arrangements regarding the conference in Bogotá, Colombia in May.
- *Ethics Consultant*: Elliot Barlow. The ethics consultant was tasked with attending the ethics workshop, preparing the ethics statement, and working with the other team members to produce the finalized Code of Ethics.
- *Presentation Skills Consultant*: Greg Quandt. The presentation skills consultant attended the Presentation Skills workshop, reported back to the

other team members, and assisted all subgroups in the creation of final presentations.

In addition, there were no changes to sub-team assignments and the breakdown of teams was as follows.

Pediatric Work Breakdown Structure

The responsibility of the pediatric subgroup was focused on creating an educational module about prosthetic and orthotic treatments for the pediatric age group; to accomplish this, the individual tasks were assigned as follows:

- Lydia Benger, Mechanical Engineering
 - Definition of normal functioning and activities of daily living (ADL)
- Robert LaRue, Mechanical Engineering
 - Treatment of pathologies arising after birth
- Stefanie Rozborski, Art History
 - Treatment of in utero and congenital pathologies

Adult Work Breakdown Structure

The Adult subgroup was tasked with the creation of an educational module for orthotic and prosthetic technicians on the particular issues and pathologies associated with the adult population. This group of subjects was defined as those that are principally associated with individuals between the ages of 20 and 55.

- Ross Allen, Aerospace Engineering
 - Biomechanics, Pathologies, Statistics
- Elliot Barlow, Aerospace Engineering
 - Vocabulary, Orthotics needs, use, and construction
- Seth Buntain, Aerospace Engineering
 - Prosthetics needs, use, and construction

Geriatric Work breakdown structure

The objective of the Geriatric subgroup was to create an educational module that overviews the geriatric population in regards to orthotic and prosthetic treatment and how it may affect the lives of the geriatric population. For research purposes, the geriatric subgroup focused on individuals generally of the age 50 and above. As people age, their physical health care needs change considerably. O&P technicians must be trained to compensate for this. The tasks within the subgroup are divided as follows:

- Marisa De Nicolo, Mechanical & Materials Science Engineering
 - Materials and fabrication of Orthotics & Prosthetics
- Emily Moore, Aerospace Engineering
 - Daily Living: Lifestyles at old age, Potential obstacles

- Gregory Quandt, Mechanical & Materials Science Engineering
 - General well-being: mental, emotional, & physical health
- Heather Selby, Biomedical Engineering
 - Availability of care, Common ailments

All sub-teams are worked according to schedule and completed sub-team work by April 10th. This work includes the educational module, low-cost demonstrations, and vocabulary handout sheet.

6. Obstacles

With any project there are always obstacles that appear along the way and must be overcome in order to achieve set goals and objectives. For IPRO 309, this was indeed the case.

One obstacle arose in delineating the boundaries of the age groups. For example, the geriatric subgroup did not want to ignore common pathologies that might apply to both the adult and geriatric populations; however, at the same time, they also did not want to take away from the adult subgroup's purview. Likewise, it was also difficult to determine when childhood ends and adulthood begins. Throughout, avoiding duplication of effort while at the same time covering as much material as possible was a primary goal. To overcome this obstacle, the IPRO team set aside time to make a unified decision about when each age group ~~ended~~began and ~~began~~ended.

Furthermore, another obstacle was narrowing down what information should go into the educational module. While there is a vast amount of information available, the challenge lay in finding the information that would be most useful and influential to an orthotic and prosthetic technician in training. This obstacle was overcome by conducting in class presentations of the educational modules. These updates allowed each subgroup to hear the constructive criticism of the rest of the team.

A third obstacle encountered was material translation. The primary language at Centro Don Bosco is Spanish. Currently, there are no Spanish speaking team members. This obstacle has yet to be overcome, but future work will include material translation with the assistance of previous team members.

As the project continues into future semesters, IPRO 309 has high hopes of overcoming all obstacles and achieving all secondary objectives so that progress can be made towards the completion of the primary objective: to support the accreditation of the first Category III ISPO program in Latin America.

7. Results

The project successfully created three educational modules for the pediatric, adult, and geriatric age groups. Each of these modules includes a PowerPoint presentation, a brochure, and a vocabulary supplement. Although these modules will not completely satisfy the needs of the program in Colombia, they serve as another step towards completion. The work of previous IPRO teams, this semester's work, and the intended work of future IPRO teams,

~~and this semester's work~~ will eventually allow the classroom portion of the program in Colombia to have sufficient learning materials to become accredited. Future IPRO teams will continue working to help create corresponding IPRO programs at Universidad de los Andes and at Joliet Junior College. With these programs in place, the ultimate goal of accreditation has become much easier to attain.

8. Recommendations

The modules developed for this project thus far have focused on particular pathologies or pathological groups. There now exists, both as a result of the efforts of this IPRO and its previous semesters, and from the general medical community, a great deal of information on pathologies and treatments. However, this body of knowledge does not fully encompass the goals of and requirements for ISPO category III certification. Therefore, it is the recommendation of this team that the next focus of this project should be on the less well documented aspects of ~~category~~ Category III training, namely team skills, project participation and management, and communication.

9. References

CIA World Fact Book

<https://www.cia.gov/library/publications/the-world-factbook/>

International Society for Prosthetics and Orthotics
<http://www.ispo.ws>

IPRO 309, Fall Semester 2008
<http://www.iit.edu/~ipro309f07/>

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