

# Collaborative Approaches to the Support of People with Disabilities: The Underserved and Unserved

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## Keywords

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## Abstract

**Background:** Underserved and unserved people are individuals who lack necessary health services. They can be found in both high- and low-income countries with disabilities in areas such as speech, language, hearing, swallowing, physical, and neurological, as well as other health problems. In addition, academic programs that prepare students to serve underserved or unserved communities do not exist in some countries. Collaborative projects allow those with expertise to share their knowledge, strategies, methods, and technologies with health practitioners, administrators, educators, students, and families. The goal is to assist populations who require special services. Collaborative projects can be interdisciplinary, international, or involve academic institutions or organizations. It is also essential that collaboration projects consider the strengths and assets that are present in the environment and in the population. This asset-based approach supports sustainability as long-term solutions can take advantage of existing strengths. Sustainability is essential so that the goals of projects can continue to contribute

to a population. **Objectives:** The primary objective of this article is to present collaborative projects that positively impact underserved and unserved populations. The strengths of these projects are also presented as a model for further work. **Summary:** This article presents several collaborative projects, along with the impact of these efforts.

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## Introduction

In the 21st century, we have witnessed major movements of people across the globe. One estimate is that there are 65.6 million people around the world who have left their original home country [1]. These moves are sometimes voluntary, with individuals searching for better opportunities for themselves and their families. Often, movements are forced and unplanned due to political unrest, border conflict, ethnic or religious persecution, famine, poverty, or natural disasters. Immigrants and refugees are frequently without sufficient food, water, shelter, and medical care. In addition, it is estimated that 20% of the poorest people in the world have some type of disability [2], and most lack health care. These are the underserved or unserved. The need for international collabora-

tion is essential, as there are countries that possess the technology or experts that are unavailable in other contexts.

The underserved or unserved are not all immigrants or refugees. For example, audiological services were reported as unavailable for people with disabilities who lived in Brazil, Cambodia, China, Hong Kong, and Taiwan [3], where many individuals exhibited a high incidence of middle ear problems and/or hearing loss. In China, teachers and parents were found to be unaware of the behaviors frequently associated with children with autism spectrum disorders (ASDs) [4]. The absence of this knowledge resulted in difficulty understanding the behaviors of these children, creating the inability to address their needs. These findings suggest that there is a need to collaborate globally to address the needs of individuals with disabilities in the absence of services, preparation programs, or effective technology.

### Collaboration

Collaboration is essential for several reasons [5]. For the most part, the lack of programs and technology in high- and low-income countries requires sharing expertise within a collaborative approach. The initial step in a collaborative effort is to determine the resources that will be necessary and the barriers that exist in meeting the needs of a specific community or population. In order to address sustainability, it is critical to determine existing assets. Collaborative projects serve to bring individuals from different disciplines together to address specific problems [6]. As a result of working together, professionals can offer recommendations for short-term goals and can develop effective plans of action to address long-term solutions.

Through integrating the inherent strengths of a population, the collaborative process builds an alliance with those being served [7, 8]. Collaborative projects have been developed by academic centers and associations to address the needs of underserved or unserved populations across the globe. Hence, collaborative projects may address the education or training of health practitioners, researchers, administrators, educators, students, academics, and families. For example, professionals have shared their expertise and transferred their knowledge on cleft lip/palate, hearing loss, ASDs, literacy, and other health concerns [9–13]. An example of collaborative projects that have been carried out by nonprofit organizations will be described in the following section.

### Professional Associations and Collaborative Projects

#### *American Association for the Advancement of Science: Advancing Science Serving Society*

The American Association for the Advancement of Science (AAAS) is a nonprofit organization with members in 91 countries around the globe. Members engage in scientific activities with the goal of improving the lives of populations in various countries across the world [14]. The AAAS journal reports international efforts with the goal to develop communication between basic researchers and applied clinicians. The goal is to address health issues through collaboration among international health institutions, governments, scientists, and diplomats so that science informs policy.

The AAAS journal reports projects that have tackled agricultural, health, and environmental issues such as the development of an experimental vaccine to address Ebola in Guinea and the Congo [15], scientific evidence for the role of pesticides that harm beneficial insects and contribute to the current loss of international biodiversity [16], and research in the restoration of hearing through the replacement of hair cells [17]. Another reported project was the collaboration between health care practitioners and a nongovernmental organization in Jordan to offer psychosocial support to enhance the resilience of young people affected by war and other disasters [18]. In this project, scientists recruited 800 teenaged boys and girls in northern Jordan. At least half of these young people were Syrian refugees and the other half Jordanians who lived in the region. While these health practitioners offered support for these young people's psychosocial difficulties, the young people asked the practitioners to focus on the sources of strength that they possessed, rather than focusing on their difficulties.

In summary, AAAS members engage in collaborative scientific research and efforts to address health issues faced by populations across the world. Most noteworthy in the Jordan intervention was the request by the young people that researchers identify and focus on assets and strengths, rather than focus on the psychosocial problems faced by this population. This response emphasizes the importance of an asset- or strength-based approach to achieve sustained change.

Another example of a professional association collaborative project is the initiative by the American Speech-Language-Hearing Association (ASHA) and the Pan American Health Organization (PAHO).

### *The ASHA and the PAHO*

In 2012, the ASHA Board of Directors created a Strategic Pathway to Excellence with the objective of collaboration with the World Health Organization (WHO) and other organizations. The goal was to join together to address and improve the health of people with disabilities on an international scale [19]. The WHO and the PAHO had established a collaboration to address health and human rights for people with disabilities. In 2013, ASHA joined the PAHO to create a collaboration (ASHA-PAHO) to address communication disabilities in countries that expressed the need for technical cooperation: El Salvador, Honduras, and Guyana. This collaboration was established as the ASHA-PAHO/WHO project [20].

El Salvador requested technical assistance and training for personnel working with children and adults with hearing loss. Representatives from the ASHA-PAHO project met with representatives from the PAHO-El Salvador office and representatives from the Instituto Salvadoreño de Rehabilitación Integral (ISRI). These meetings resulted in a request to provide training and technical assistance to service providers responsible for working with children and adults with hearing loss. The project provided technical assistance in the use of equipment for children and adults with hearing loss as well as providing information on the equipment and process needed to create ear molds. Due to the lack of a preparation program in El Salvador for speech-language pathologists (SLPs) and audiologists, one recommendation was to explore the preparation of their workforce in surrounding countries (i.e., Honduras was developing a phonoaudiology program). Faculty members were recruited and a technician was hired to calibrate and repair audiological equipment.

Honduras requested assistance in developing a phonoaudiology program to educate students, a program previously absent in this country. ASHA-PAHO met with the PAHO-Honduras office and the Universidad Nacional Autónoma de Honduras (UNAH). The goal was to create a communication disorder program (Phonoaudiology). The first step was to obtain approval from university officials, and the second step was to plan the program and assure sustainability. The UNAH recruited faculty from different countries to support this academic program. The new phonoaudiology program opened in January 2017 with 37 students enrolled. This program includes classrooms, laboratories, clinical facilities, and a learning center with communication technology equipment [20]. The new program received

technical assistance on curriculum development, consultation on the basic equipment required in the rehabilitation clinics, and information on state of the art assessment.

Guyana requested technical assistance to strengthen strategies for early detection and intervention for communication disabilities. Their request was for support to create a training program in communication disabilities and develop an awareness campaign. There was a request to review the current curriculum and to make recommendations as to how to create a new curriculum, recruit volunteers to assist with service delivery, and provide websites to develop community awareness. ASHA-PAHO members met with the Ministry of Health and the PAHO-Guyana office. The delegation made presentations at Guyana hospitals and met with faculty from the University of Guyana.

Faculty in Guyana expressed a desire to collaborate in developing the curriculum and determining the needs of the audiology component [20]. A committee was developed to review and make recommendations. Recommendations included (1) technical assistance for the Ministry of Health to expand speech-language pathology and audiology programs, (2) reviewing and updating the curriculum for the bachelor's degree program for physiotherapy, occupational therapy, and speech-language therapy, and (3) providing technical assistance for training programs. The ASHA-PAHO collaboration also provided technical assistance with identification of the steps needed to create a university program to educate speech-language therapists and audiologists, a selection of professional books and materials for education, and ASHA-certified SLPs and audiologists to assist in service delivery and in professional development programs. This collaboration also generated a revised curriculum for the speech-language and audiology program to ensure that students would be able to supply competent services.

In summary, the ASHA-PAHO collaboration has contributed to the development of academic programs for speech-language pathology and audiology students and supporting those who work with adults and children with hearing loss, while improving the delivery of services to populations with needs. This is an ongoing project that also focuses on the sustainability of these efforts through continued monitoring of progress. The following description of collaboration contains an example of a research project.

## Research Collaboration

### *Crosslinguistic Phonological Development: An International Collaboration*

An international collaborative project investigated phonological development across various languages to develop assessment tools and treatment activities [21]. These goals emerged from the perception of the increased need for speech-language therapists who work with bilingual or multilingual speakers. This collaborative project worked with native speakers of various languages, including Romance (Canadian French, Granada, Mexican and Chilean Spanish, and European Portuguese), Germanic (German, English, Swedish, and Icelandic), Semitic (Kuwaiti Arabic), Asian (Japanese, Mandarin), and South Slavic (Bulgarian, Slovene). Materials were also developed for Anishinaabemowin (Algonquian, Canada), Brazilian Portuguese, European French, Punjabi, Tagalog, and Greek.

Data was collected from preschool-aged speakers of these languages. In addition, the team of international collaborators developed an open-access website where assessment tools and resources were made available, along with tutorials, intervention activities, and references.

In summary, this project assists practitioners who work with bilingual- or multilingual-speaking children. There is continued work on this project to develop the availability of materials on the website. The following collaborations describe projects that consist of families and educators.

### **Collaborations with Families and Educators**

#### *Collaboration with Families and Educators to Support Language and Literacy Development in the Dominican Republic*

A collaboration with caregivers and educators in the Dominican Republic was developed to support language and literacy development over a period of 4 years [22]. Faculty and students from North Carolina Central University in the USA participated in social gatherings with children, caregivers, and educators such as dining together, singing songs, playing games, attending church, and general interaction. Interpreters were provided to address the main challenge of communication across language differences. Faculty and students worked with interpreters during meetings, workshops, and screenings, and shared book-reading sessions. Workshops were organized to allow parents, educators, and caregivers to ask

questions and to share their concerns. Interviewers listened, providing feedback only after the parents expressed concerns.

Strategies and approaches to address parents' concerns were presented in written form, with the goal of addressing sustainability. Following these workshops, formal language screenings were provided and results shared with parents and teachers. Supporting materials and strategies were offered for children with speech and language impairments, along with models of language and literacy enhancement for book-reading activities. This project provided language and literacy kits that contained literacy tools (pencils, crayons, markers, paper, books) and suggestions for shared reading and workbook activities.

In summary, the outcome of this project was the delivery of knowledge and solutions to the needs of teachers and parents to address children's language and literacy skills. Workshops were developed to encourage interaction with families and educators. One major factor in this project was the use of written strategies for families, given that purely verbal interaction does not necessarily provide a sustainable record of transmitted information.

#### *Collaboration with Families and Educators to Address the Knowledge of Autistic Syndrome Disorders in China*

A collaboration was developed to support children with ASDs in Guangzhou, China [4]. Professionals from Hong Kong, Taiwan, and the USA participated in a project at the University of Guangzhou. The goal of this collaboration was to educate teachers working with special need populations and to provide assistance to parents. Many teachers and parents did not understand the behaviors children with ASD [23]. Consequently, they were unaware of the factors that may affect or cause these behaviors (e.g., agitation or covering their ears). Without this awareness, the children lacked appropriate support.

Experts believe that many children with this condition may not be correctly diagnosed [24–26]. To address this problem, the Chinese Ministry of Health funded a national survey of ASD prevalence [27]. This collaboration addressed children identified with ASDs. The Guangzhou Bureau of Education sponsored a 3-year grant to offer continuing education to a selected number of special education teachers from all schools under the bureau. Through the collective efforts of SLPs and audiologists, a series of training workshops were held in 2013, 2014, and 2015. The goal was to improve the quality of the services available to these children by providing teachers with important information regarding this disorder.

At least 2,000 teachers participated in educational workshops designed to improve the knowledge and skills necessary to provide appropriate services for these children [28, 29]. SLPs participated in panel sessions to respond to questions from teachers, and teachers described many cases of behaviors of ASD children that presented them with difficulty. Strategies and methods provided for working with these children were met with a positive response. Evening sessions were held to allow parents to raise topics of concern about educational issues related to their children's problems. These training programs enhanced better understanding of the typical behaviors associated with ASD, supplied methods to address children's behaviors, and provided understanding of the environmental factors best suited to prevent behavior challenges.

The strategies presented the reasons and the correct approaches to children's social-emotional needs, such as the reason children might hide under a table or in a closet, sing, or cover their ears when exposed to noise or other sensory factors in the environment. Strategies were also presented to address emotional regulation through appropriate behavioral approaches, interventions, and resources to address sensory processing disorders. Strategies to address environmental factors that have an impact on the children's sensory difficulties in the classroom were also offered. Teachers were given approaches to the visual and auditory aids that would benefit children within the classroom, based on the control visual stimuli and noise. The bureau of education of the city of Guangzhou decided to continue the effort to help teachers become more familiar with the challenges associated with individuals with special needs. Funded by the bureau of education, workshops have continued to provide teachers with continuing education, reading materials, and mentors.

In summary, this project contributed to the knowledge of families and educators working with children with this disorder. The project also led to continued education for educators working with children with special needs, establishing sustained efforts for support.

### **Collaboration to Establish University Study Abroad Programs**

#### *Collaboration to Address Barriers for Communication Disabilities in Ghana*

An ongoing collaboration project led by the Teachers College of Columbia University (TC) team of faculty and speech-language pathology students was organized to

immerse graduate students in various cultures across the globe to deepen their understanding of cultural differences and service delivery [30]. Each year, graduate students are offered trips to Latin America (Bolivia, Colombia, and Ecuador) or Africa (Ghana or Ethiopia). The supervising faculty, clinical supervisors, and students work with local speech-language therapists, special education teachers, medical personnel, and families of people with disabilities. The project offers services and workshops and presents strategies and techniques that address sustainability. Graduate students work in a school for the deaf in Bolivia, providing approaches for oral/aural Spanish literacy. In Bolivia, Ghana, and Ethiopia, workshops offer low-tech Augmentative and Alternative Communication (AAC) approaches for professionals and families of children with intellectual disabilities and autism. Cleft palate speech courses that address speech production following cleft palate repair are offered to students and patients in Colombia, Ecuador, and Ethiopia.

The collaborative project in Ghana consisted of the TC team, teachers, school staff, and parents. The goal was to address the needs of children with communication disabilities. Parents specifically requested that they wanted their children to be able to purchase food in the markets. To address this request, the TC team created AAC cards with functional vocabulary depicting food items found in the market. Another request was to improve individuals' speech efforts following cleft palate surgery. The TC team worked with nurses, SLPs, audiologists, otolaryngologists, and dentists to share methods and strategies. Results showed significantly improved speech efforts following this collaborative project.

In summary, the goal of this project was to strengthen students' understanding of cultural differences, while providing support to people with disabilities within these countries. These projects are supported with continued monitoring of efforts to assess sustainability. Findings have been that there is continued use of AAC materials. In addition, each visit offers additional workshops to provide further information. The following collaborations describe interdisciplinary projects: a noise-induced hearing loss project and a literacy project.

### **Interdisciplinary Collaborative Projects**

#### *A Collaborative Project to Address the Prevention of Noise-Induced Hearing Loss*

Collaboration between an SLP and an audiologist addressed the prevention of noise-induced hearing loss

(NIHL) in the USA [31–34]. Prevention of NIHL is crucial, given the great number of individuals with hearing loss across the globe. The WHO estimates that at least 1.1 billion teenagers and young adults are at risk of hearing loss due to unsafe use of personal audio devices and exposure to damaging sound levels [35]. In this interdisciplinary collaboration, participants' listening levels were measured while they were listening to personal audio devices, such as iPods. This project took place on a college campus and on busy city streets. Participants were given information on safe listening levels and information on NIHL. Within this collaboration, there have been multiple appearances on television and in other media (journals, websites, and newspapers) that have addressed prevention. These efforts continue to date. Further efforts consisted of the hearing assessment of college-aged students [36]. Findings were that half of these students had sustained NIHL. However, none were aware of their hearing loss, given that NIHL is an insidious process with hearing loss deteriorating over time.

The goal to educate people in the prevention of NIHL is an international effort undertaken by the WHO [37]. The WHO established a global collaboration among specialists in audiology, otology, public health, epidemiology, acoustics and sound engineering, members from the International Telecommunications Union (ITU) organizations, and officials from standardization organizations, nongovernmental organizations, and consumer groups. A meeting in 2018 was held to assess progress on the global NIHL prevention initiative that addressed the dangers of noise in the workplace and in recreational use of listening devices.

In summary, the danger of excessive noise is being addressed at the international level. Prevention through education has been the primary goal of all efforts. This is important because the onset and progress of hearing loss due to noise exposure is an insidious process and knowledge of the effects of noise are essential for prevention.

#### *A Collaborative Project to Address Literacy in South Africa*

An interdisciplinary collaboration project addressed kindergarten-aged children's literacy skills in South Africa [38]. This project focused on young children from marginalized communities. Early childhood development (ECD) teachers of kindergarten-aged children were given training by an SLP in strategies for oral reading, one-on-one reading, and paired reading. These children lacked access to SLP services. Post-intervention findings revealed a significant increase in the experimental group

scores on print concepts. The ECD teachers reported a difference in the children's knowledge of print awareness, confirming that these approaches to teachers' instruction are central.

In summary, these findings confirm that an emergent literacy and language project is successful in the support of children in marginalized communities. Explicit early instructional intervention can develop language and literacy skills to ensure school readiness and academic success.

### **Educational Collaboration Projects**

#### *Summer School Speech-Language Therapy Program*

The Intensive Program (IP), initiated by the Department of Speech-Language Therapy and Audiology at Thomas More University College in Antwerp, Belgium [39], began with the participation of 14 universities/colleges across Europe. This program has expanded to include the participation of other universities and colleges across Europe. The SLP program gives bachelor's and master's speech therapy students the opportunity to meet with senior researchers and experts, along with students from across the globe. Speech-language pathology and audiology students are provided with the opportunity to meet peer groups from different linguistic and cultural groups. The program includes theoretical lectures, hands-on seminars, and interactive seminars.

Partners in this program have included students and faculty from Belgium, Austria, Finland, Germany, Greece, Ireland, Italy, Malta, Spain, Sweden, Taiwan, the Netherlands, Hong Kong, and the USA. Lectures provided current information on cochlear implants, dyslexia, reading and writing disabilities, childhood apraxia of speech, auditory processing skills, voice disabilities, and augmentative and alternative communication.

In summary, this program has been successful in attracting faculty and students from across the globe. This collaborative project allows students and faculty from all over the world to be exposed to other cultures and ideas and gain educational opportunities to learn evidence-based approaches to global health issues.

#### *Development of a Speech-Language Pathology Program in Malaysia*

A graduate speech-language pathology program in Malaysia was created over 20 years ago in collaboration with program developers from Australia, Hong Kong, and the UK [40]. To address the lack of instructors, can-

didates from linguistic and psychology programs were supported for graduate level speech-language pathology education in the UK. A challenge was the absence of educators to initially develop the program. However, there were existing strengths in the audiology program. Consequently, this was identified as the area for focus in the initial development of the program, with speech-language pathology students paired with audiology colleagues. A cochlear implant program was later established with services provided to hundreds of children. Another challenge was the absence of knowledge of speech-language pathology. To address this challenge, faculty members presented information on television and radio and wrote newspaper articles. A linguist helped students learn local languages (Malay and Chinese dialects) and assisted with their interactions with families.

In summary, collaboration across countries played an essential role in developing this program. In addition, two other speech-language pathology programs have been developed in Malaysia. Developing these programs required a great deal of effort to establish a student body and faculty. Additionally, it was necessary to educate families regarding this area of health care, in order to encourage their support for students to enter the program. These are factors to consider when developing a program in a country that lacks this area of study.

## Discussion

Global collaborative projects have been successful in adapting to the needs of health practitioners, children, adults, and families in areas where health services are needed. Collaborative projects have addressed the barriers to services that are essential to health disorders and to prevent disorders. The advantage of collaboration is that participants can share information, develop additional and further approaches, and develop plans to address populations' needs. Collaborative projects have also been successful in developing programs to educate health practitioners in countries that lack these programs or are unaware of methods of prevention. The described collaborative projects have been successful in educating and providing technological support and strategies to health professionals, administrators, educators, students, and families.

Many programs originate in academic centers or begin in organizations. In these case, there is financial support for these efforts. Grant writing is essential for most research efforts. In this case, there are professionals who

can assist in these efforts. All collaboration programs described in this article that originate in academic centers have received support from their college or university. In one example, the NIHL project received support from two colleges for certain devices required to measure sound output of the participants' listening devices and a sound meter to measure ambient sound. A grant was also obtained for student research assistants. The collaboration project organized by the Teachers College of Columbia University (TC) began in 2006 and allowed all SLP study master's students to participate in the international program. Students register for this project as a course, which meets the requirements for the program. All costs for travel and hotel are borne by students. There are opportunities for fund-raising for students who would like to be part of the project. In summary, grant writing is the essential path for developing projects.

The described projects have also addressed two important goals: sustainability and asset- or strength-based approaches. In terms of sustainability, these projects have worked to provide continuity in their efforts to address goals. Some collaborative projects have addressed target goals requested by the populations they served. Other projects have created forums for people to express their needs and concerns, while others have focused on goals that address absent services. In the project that addressed young people's stress in Jordan, health practitioners were reminded to consider the young people's assets and strengths when providing assistance. Thus, this provides support to the importance of taking asset- or strength-based factors into account, rather than a focus only on problems or deficits. An asset-based approach allows the population to draw on factors or structures that are already present, providing support for successful and sustained efforts. Sustained factors are present to allow the ability to build on, strengthen, and expand these elements.

Educational programs are also important for instructing students in culturally appropriate approaches for assessment and intervention. It is essential that academic programs offer courses that address communication disorders, as this knowledge has been shown to play a significant role in students' understanding of differences versus disorders [41, 42]. Another important educational goal is to provide students with opportunities to learn from and interact with other health professionals. This facilitates understanding the role of other health professionals when working collaboratively [43].

While there are many benefits to these efforts, there are also obstacles that affect collaboration, such as geographical borders and different time zones. However,

Google Docs, a web-based application that supports collaborative projects, allows authors to work together on a document from diverse locations across the globe [44]. Skype allows participants in different nations to engage in discussions from anywhere in the world [45]. Time zone differences can be addressed by surveying participants regarding preferred times for communication. In summary, difficulties can be addressed and solved to facilitate the work of collaborative projects that play an important role in local and international health issues.

## Summary and Conclusions

Collaboration allows for sharing of resources, knowledge, and expertise. It also allows access to technology and research equipment that is unavailable in certain places. Consequently, international collaboration or collaboration across borders was essential in certain projects, given that the technological and expert supports were unavailable to the population in certain contexts. Collaboration leads to improved services for the disabled

and for underserved or unserved populations. Successful collaborations may generate future efforts that contribute to meeting the needs of an even greater number of people and communities. Although there may be difficulties associated with collaboration across borders, the benefits to participants and target populations are far greater than any problems that may be encountered. Hopefully, the examples provided in this paper will serve to encourage and guide professionals in developing collaborations on a global scale. It is also essential to consider asset-based or strength-based approaches to collaboration, taking into account the skills and resources of a population or community when developing a project. This approach ensures that participants are treated with respect and that the results of the project are sustained by building on existing forces.

## Disclosure Statement

As our ethical obligation as researchers, we report that we have no financial interests or potential conflicts regarding the research reported in this paper.

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