

Clinically related global service undergraduate research involving assistive devices in less-resourced settings facilitates competency-based learning

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Abstract

LeTourneau University has found that combining the competency-based educational benefits of undergraduate research and global service learning provides significant competency-based learning benefits. Students participate in research projects focused on the functionality of assistive devices designed for less-resourced settings.

An example: Wheels - one of our projects

Many wheelchairs are donated to less-resourced countries by well-meaning organizations without regard to local, cultural, and physical conditions. Often times they are also provided without ensuring appropriate knowledge, tools, and support are present¹. In the last ten years, several organizations have begun to provide wheelchairs manufactured for use in less-resourced settings, but there have been very few long term field studies to confirm that these chairs work well in their intended settings. The Wheels project is an undergraduate research study that provides one comparative long term study each year in partnership with Bethany Kids Relief and Rehabilitation at Joytown, a boarding school for children with disabilities in Thika, Kenya. Wheels facilitates provision of the wheelchairs. After the chairs have been in use for several months, the team comes to Kenya for three weeks to collect data. After seating specialists and therapists ensure the children are safe and the chairs are in good repair, students collect data including: the energy cost of rolling in each chair; maneuverability; and questionnaire feedback from users, caregivers and clinicians. This data is then made available to the manufacturer to enable design improvement.²

1. Guidelines on the provision of Manual Wheelchairs in less resourced settings. World Health Organization, 2008.
2. Jefferds A, Beyene N, Upadhyay N, Soker P, Perlman J, Cooper R, Wee J, 2010, Current state of mobility technology in less-resourced countries. Phys Med Rehab 221-2242

Methods

Between 2007 and 2011, 29 students participated; preparing and doing preliminary research in the US, and then traveling to complete the data collection in foreign cultures, working with medical professionals and the people with disabilities they serve. Benefits to the students were measured using a self-report questionnaire developed at the University of Michigan which focusses on four primary areas of benefit: academic performance, personal growth, intercultural awareness and professional development³.

Hudzik JK, Ingraham EC, Peterson DL (eds) 2003 Widening opportunity and commitment to study and learning abroad; proceedings of the national conference on study and learning abroad. East Lansing, MI, Michigan State University

Results

Overall the students indicated they had benefited strongly. The impact of working with professionals from another culture gave valuable insights; However, many of the students expressed that serving children who were often so joyful in spite of their very difficult lives was especially life changing. Several students currently in medical school have since indicated by personal communication that they felt their participation facilitated their admission.

Discussion

While benefits to students have been clear, there have been significant challenges. These included finding funding, arranging international collaborations that significantly benefit all parties and selecting research questions and protocols which can be successfully implemented by undergraduates in low-income settings. We've found that when challenges are properly addressed, competency based pedagogical goals for pre-health students are strongly reinforced.

Figures 1-4. Percent of participants selecting each Lickert scale option for each question.

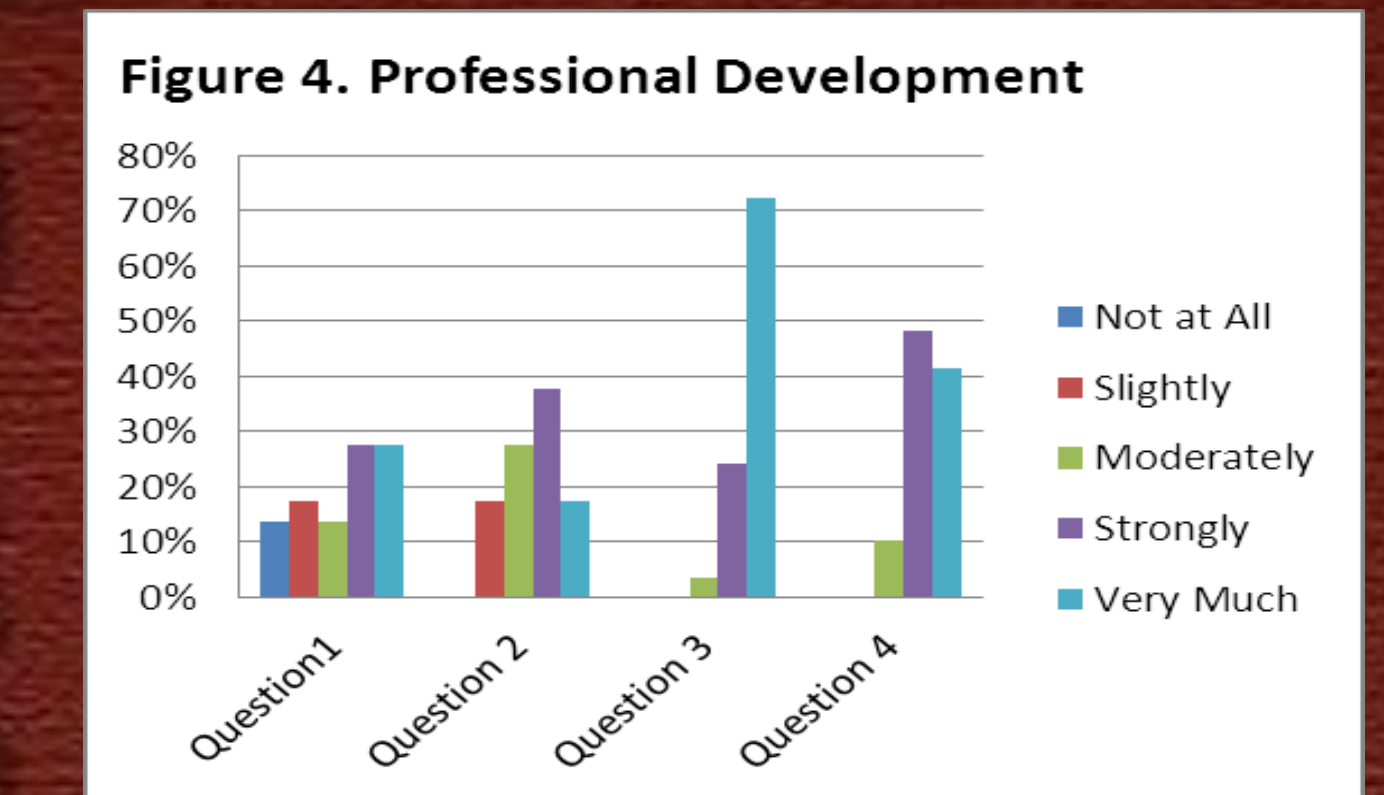
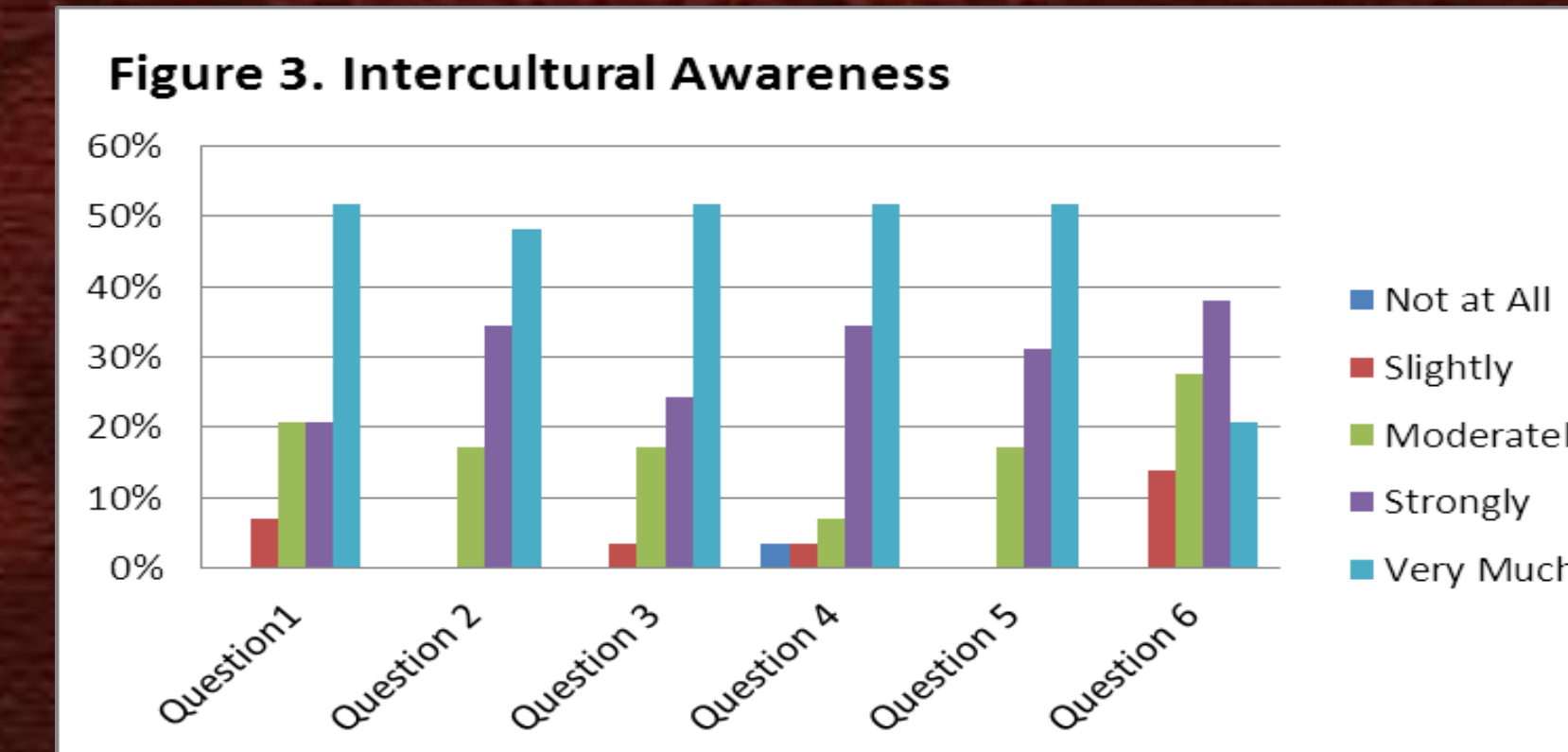
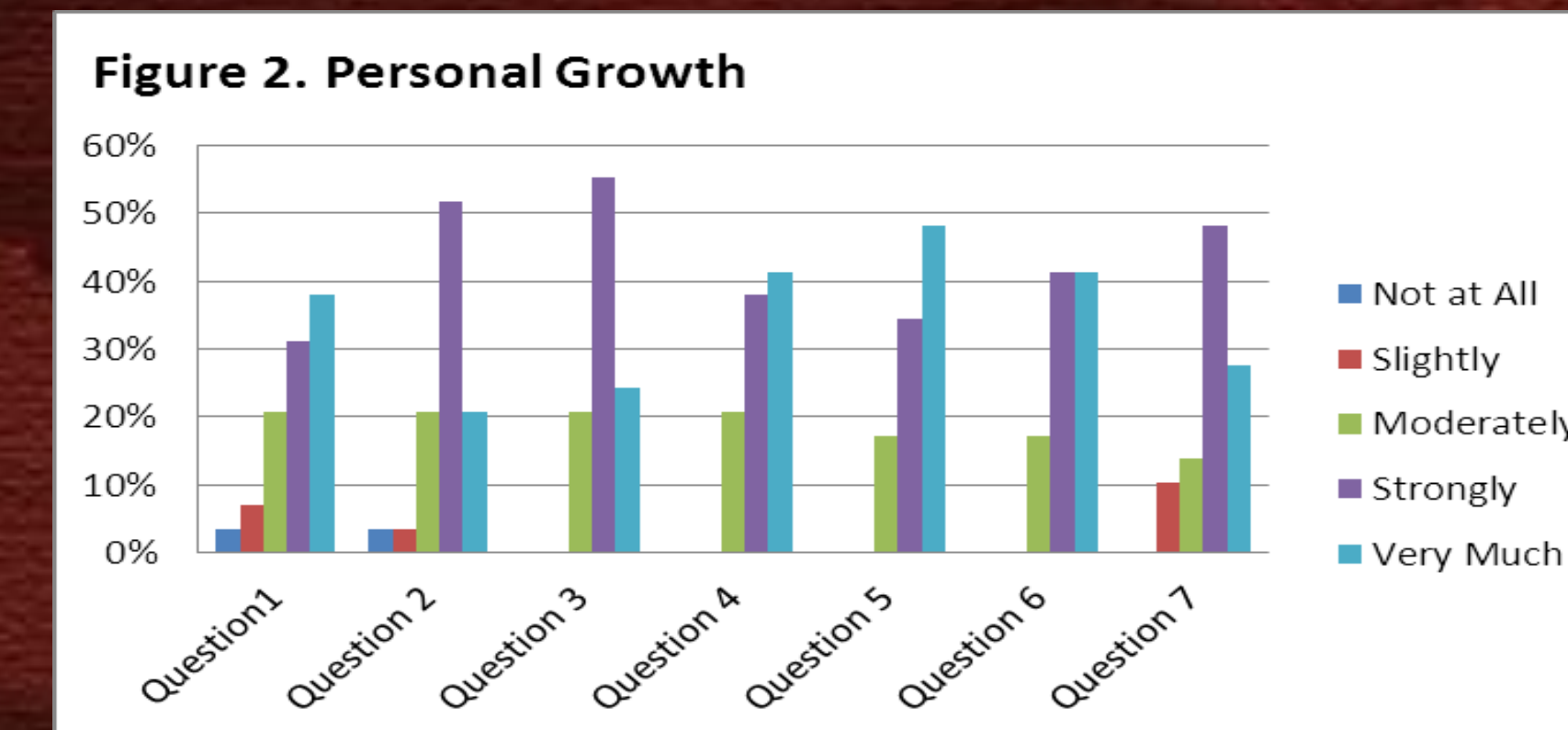
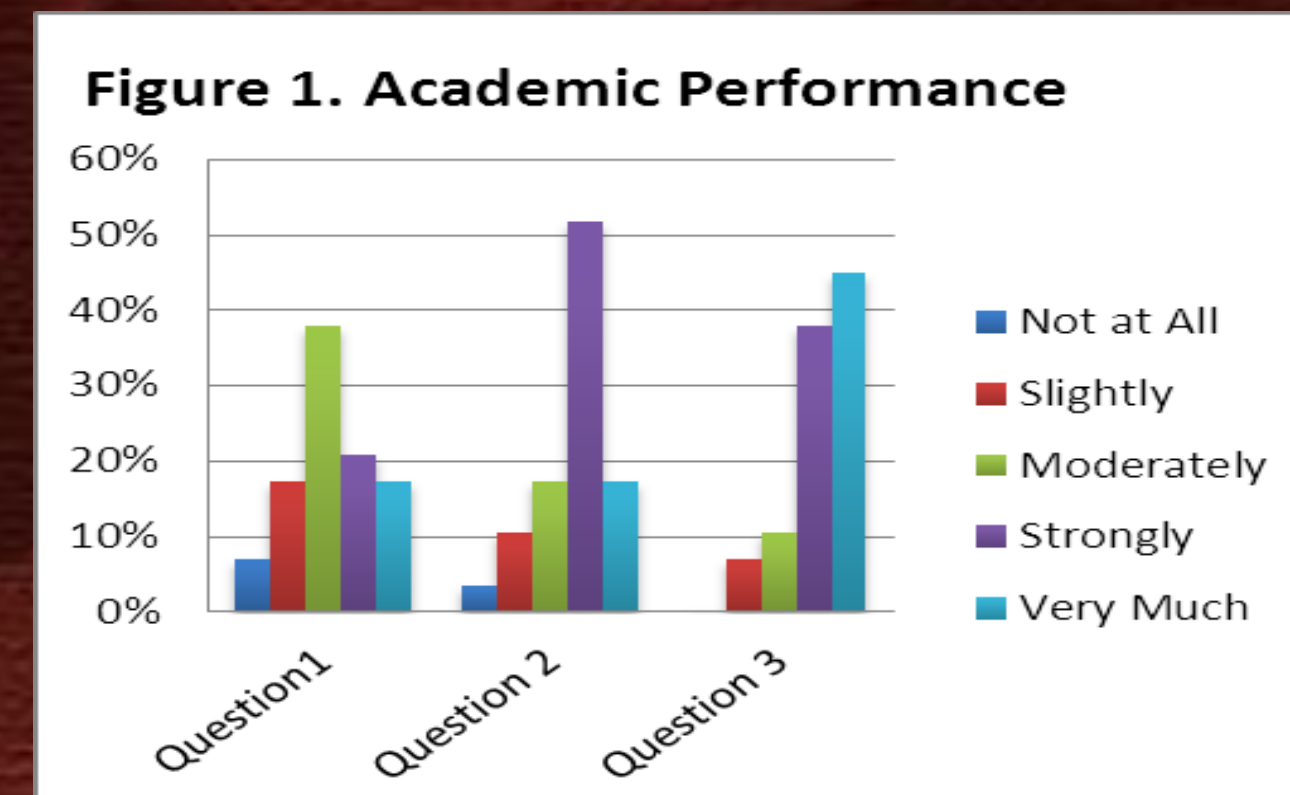


Table 1. Response means for self report questions on the benefit of global service learning based clinical research. Questions were answered on a lickert scale: 1 not at all; 2 slightly; 3 moderately, 4 strongly; 5 very much

Participation in international research has . . .	
1. contributed to my desire to begin learning a foreign language.	3.2
2. led to an improvement of my academic performance.	3.7
3. enhanced my critical thinking skills.	4.2
Mean for the academic performance category	3.7
1. enhanced my independence.	3.9
2. enhanced my self reliance.	3.8
3. improved my problem-solving skills.	4
4. helped me develop leadership skills.	4.2
5. increased my level of comfort with people different from myself.	4.3
6. increased my ability to interact effectively with people from different backgrounds.	4.2
7. increased my feeling of personal effectiveness.	3.9
Mean for the personal growth category	4.1
1. enhanced my understanding of international issues.	4.2
2. contributed to my understanding of other cultures.	4.3
3. increased my appreciation of human difference.	4.1
4. increased my curiosity about other cultures.	4.3
5. contributed to my understanding of my host country.	3.2
6. increased my understanding of my own culture.	3.7
Mean for the intercultural awareness category	4.0
1. made me reconsider my career plans.	3.4
2. helped me find professional direction.	3.6
3. broadened my understanding of the issues that arise professionally in a developing world setting.	4.7
4. enhanced my ability to work as a team player in solving problems.	4.2
Mean for the professional development category	4.0

Table 1: Response means and full text of questions.



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