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Global Interprofessional STEM Education: A U.S.– Mexico Dual Degree Model for Advancing Global Health Competence

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ABSTRACT

This study examines an innovative cross-border dual degree program in medicine and public health developed through a partnership between universities in the United States and Mexico. The program integrates STEM education with interprofessional education (IPE) to prepare students for collaborative leadership in global health systems. Through interdisciplinary coursework, international mobility, and experiential learning in diverse public health contexts, students develop competencies in systems thinking, cultural responsiveness, and interprofessional collaboration. The program also strengthens institutional partnerships, promotes knowledge exchange, and expands global health training opportunities for future healthcare professionals. Findings suggest that cross-border dual degree models can serve as effective platforms for integrating STEM and public health education while fostering globally competent physicians capable of addressing complex health inequities and emerging public health challenges.

Keywords: Collaboration, dual degree, global health, interprofessional education, public health, STEM integration

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INTRODUCTION

The integration of STEM education with interprofessional education (IPE) in public health and medicine is a critical step toward preparing a workforce capable of addressing complex global health challenges through collaborative, systems-based approaches. STEM disciplines provide the scientific and technological foundation, while IPE fosters the collaborative competencies needed to work across disciplines and borders. A global interprofessional undergraduate dual degree program in public health and medicine, especially one co-developed with partners in Mexico and the United States, exemplifies how such integration can advance the internationalization of STEM education. This program not only exposes students to diverse cultural and epidemiological contexts but also promotes the development of transdisciplinary skills and global health literacy (Wu et al., 2020; Chans et al., 2025; Zwanikken, 2015). Through immersion in real-world public health systems and collaborative learning with international peers, students gain a deeper understanding of the intersection between science, health equity, and social determinants, positioning them to become leaders in global health innovation and policy.

Global health challenges are complex and multifaceted, demanding equally comprehensive and multifaceted responses. A great illustration is the COVID-19 pandemic which brought public health, medical, biomedical, behavioral, environmental and social professionals together to collaborate on multifaceted strategies to address a global pandemic. The role of interprofessional teams has become key to addressing health challenges. Public health training, within these interprofessional teams, has become essential to taking a more proactive approach to addressing health challenges by focusing on health promotion and disease prevention.

The World Health Organization (WHO) published a Framework for Action on Interprofessional Education & Collaborative Practice in 2010 that served as a guiding resource within the context of global health. Authors identified that “collaborative practice in healthcare occurs when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across settings” (p.13). This definition highlights the benefits of integrated care models and interprofessional practice in reducing redundancies, improving health outcomes and bringing diverse perspectives to healthcare.

BRIDGING PUBLIC HEALTH AND MEDICINE

The fields of public health and medicine have coexisted for many years. Coordinated efforts, including immunization initiatives and the growing recognition that chronic diseases require both public health interventions and clinical management, have underscored the critical importance of interprofessional collaboration and training in advancing health outcomes (Valaitis, Wong, & MacDonald, 2020). Despite these benefits, healthcare professionals around the world often continue to be trained in isolation, with each discipline conducting its educational activities independently and with minimal interaction across professions (Nawagi et al., 2025). Bridging training in a field such as public health which focuses on disease prevention and health promotion at a community level (Merzel & D’Afflitti, 2003) with the field of medicine which focuses on diagnosis and treatment at the individual level (Oliinyk, Maltsev, & Shydlovska, 2024), will prepare the next generation of public health physicians.

One of the main benefits of public health training for physicians is taking a more proactive approach to addressing health challenges by focusing on health promotion, disease prevention and the enhancement of overall well-being at the population level. Adopting this approach will help physicians to move from addressing individual's health needs to making well-informed recommendations at the community level. Another benefit is a deeper understanding of the social determinants of health (SDOH). These determinants, as defined by the WHO (2023) "are the non-medical factors that influence health outcomes. They are the conditions in which people are born, grow, live, work, and age..." It is estimated that SDOH influence 50-60% of health outcomes (Schanandore, Gamston, Hohmann, et al., 2025). Understanding how factors such as income, access to education, employment, built environments and access to healthcare significantly impact health outcomes, will help physicians to better address health challenges by improving diagnostic accuracy (Williams, Walker, Peek & Chin, 2023); enhancing treatment planning (Schanandore, Gamston, Hohmann, & colleagues, 2025); and reducing healthcare disparities (Walker, Strom Williams, & Egede, 2016).

Public health training also provides physicians with the tools needed to analyze data and better understand epidemiological trends. These skills encourage physicians to make evidence-based decisions that improve health outcomes for individual patients and their communities. By having these skills and evidence-based knowledge, physicians can also play an important role in creating and implementing public health policies that can potentially have a positive impact in their communities. These public health policies influence and shape behaviors and systems by creating sustainable changes with the goal of preventing diseases and promoting health.

DUAL DEGREE IN PUBLIC HEALTH AND MEDICINE: A UNIQUE U.S.-MEXICO COLLABORATION

The University of Arizona's Zuckerman College of Public Health in collaboration with Universidad del Valle de Mexico created an interprofessional dual degree program in medicine and public health with an emphasis on global health. This innovative program was the first undergraduate public health and medicine dual degree program in Mexico and served as an example of how medical education and public health training can be combined to train the next generation of medical and public health leaders in the country.

This dual degree in public health and medicine offers a strategic approach to addressing Mexico's current health priorities, which include strengthening primary care and health promotion, guarantee that all clinics and hospitals have the needed equipment and medicine, and update and create one single health system (Ministry of Health, 2024) Both, Mexico and the United States, face persistent challenges such as diabetes, obesity, hypertension, and cardiovascular diseases, alongside ongoing concerns about maternal health, child health, and access to essential services in underserved rural and Indigenous communities. Preparing future health professionals with an interdisciplinary foundation in both public health and clinical medicine equips them to understand the broader determinants of health while also providing patient-centered care. In this way, this interdisciplinary dual degree program aligns with Mexico's commitment to advancing universal health coverage and improving population health outcomes through an interprofessional, systems-based approach.

Before the launch of this dual degree program in 2024, detailed evaluation of both programs' curricula was conducted to assure learning outcomes and competencies were met. The curriculum evaluation and articulation process took place in the following five distinct phases:

Areas of Opportunity Exploration

This unique collaboration started with an exploratory conversation to consider different areas of opportunity. It was important for both institutions that this collaborative effort was beneficial to both partners. Equally important, was to identify an area to complement each other's programs and innovate.

Review and Evaluation of Curriculum

Once the specific programs from each institution were identified, curriculum and current study plan were translated and sent to evaluation. Non-public health courses were sent to different departments for evaluation. Public health related courses went through a two-step evaluation process. First, a table summarizing course description and learning objectives was used for a preliminary evaluation. This was then followed by a detailed syllabus evaluation by two content experts to determine equivalency, content gaps, substitution or denial.

Verify Inclusion of Learning Outcomes and Core Competencies

Part of the innovation and strength of this partnership is that both programs are individually accredited. The University of Arizona's public health program is accredited by the Council on Education for Public Health (CEPH) and Universidad del Valle de Mexico's medical program is accredited by the Mexican Council for Accreditation of Medical Education (COMAEM). It was important for this process to ensure both programs were meeting their required learning outcomes and core competencies as part of this articulation process.

Articulation of Courses

After evaluation of course content, learning objectives and competencies, collaborators met to talk about some specific courses that required content updates to be granted equivalency status. Some courses only require the addition of a module on a specific topic or an update on an assignment to clearly assess certain competencies. In other cases, if the changes were not permitted or possible, collaborators looked for other course options to satisfy specific requirements.

Collaboration on the Creation of an Innovative Interdisciplinary Study Plan

Taking advantage of the strengths that each program brings to this collaboration, an innovative interdisciplinary study plan was created. Students start University of Arizona courses in English composition to build a strong foundation as they progress to public health courses in later semesters. There was careful consideration of students' course load, course prerequisites, course sequencing and timing of clinical rotations. Although a final study plan was approved by both institutions' curricular affairs offices, this study plan is treated as a living document that will require future updates and reevaluation as programs' curricula evolve.

PROGRAM IMPLEMENTATION AND PRELIMINARY STUDENT EXPERIENCES

The initial implementation of the interprofessional dual degree program has highlighted both its innovative potential and its inherent complexity. Early feedback from students indicates strong appreciation for the program's interdisciplinary curriculum, global health focus, and real-world application; however, several logistical and pedagogical challenges have also emerged, including varying academic calendars, differences in institutional policies, and the need for harmonizing assessment standards across disciplines and countries (Wu et al., 2020). Although a full program evaluation is still forthcoming, preliminary insights from students, faculty, and administrative staff emphasize the importance of continuous feedback to inform iterative improvements. This is particularly vital for a program that intersects medicine, public health, and international collaboration, domains that each carry distinct pedagogical and operational demands (Johnson et al., 2019). The success of such a unique and ambitious initiative depends on sustained cross-institutional coordination, adaptability in curricular design, and the willingness to recalibrate based on stakeholder input, ensuring that the program remains both academically rigorous and culturally responsive.

FROM ACADEMIC INNOVATION TO IMPACT

This groundbreaking interprofessional collaboration in public health and medicine represents a vital initiative to train the next generation of equity-minded physicians, equipped to implement proactive measures that enhance community health in Mexico and beyond. As healthcare disparities persist, particularly in under-resourced and rural settings, the urgency of cultivating these competencies cannot be overstated. This program aspires to transform the healthcare landscape by nurturing not only skilled physicians but also strategic public health leaders capable of effecting systemic change.

Central to the program's philosophy is the recognition of the social determinants of health, emphasizing that clinical excellence must be complemented by a comprehensive understanding of the broader factors that influence health outcomes. This dual focus empowers future physicians to identify and address the root causes of health inequities, thereby promoting integrative solutions tailored to community needs.

In its inaugural year, the program has demonstrated success, leading to expansions in disciplines such as Biochemistry and Dentistry, with additional fields under consideration for future inclusion. By adopting a consistent framework across various healthcare professions, this initiative aims to build a robust network of practitioners committed to leading transformative efforts within their communities.

REFERENCES

Chans, G. M., Valle-Arce, A. P., Salas-Maxemín, S., et al. (2025). Exploring transversal competencies in engineering students through international experiences. *Frontiers in Education*. <https://doi.org/10.3389/feduc.2024.1457796>

- Johnson, C. E., Keating, J. L., & Molloy, E. K. (2019). Psychological safety in feedback: What does it look like and how can educators work with learners to foster it? *Medical Education*, 54(6), 559–570.
- Merzel, C., & D’Afflitti, J. (2003). Reconsidering community-based health promotion: Promise, performance, and potential. *American Journal of Public Health*, 93(4), 557–574. <https://doi.org/10.2105/AJPH.93.4.557>
- Ministry of Health. (2024). Health sector work program 2024-2030. Government of Mexico. <https://www.gov.mx/salud>
- Nawagi, F., Vyas, R., Kiguli Malwadde, E., Yuan, S., Bedoll, D., Adejumo, P. O., Phimister, R., Drendall, J., Seeling, J., & Suleman, F. (2025). Advancing Interprofessional Education and Collaborative Practice: outcomes of the AFREhealth-FAIMER Student Elective Exchange Program in Health Professions Education in Africa. *Frontiers in Medicine*, 12, 1516156. <https://doi.org/10.3389/fmed.2025.1516156>
- Oliinyk, Y., Maltsev, D., & Shydlovska, O. (2024). Integrated approach to diagnosis and treatment in clinical medicine: Search for optimal solutions. *Journal of Pioneering Medical Sciences*, 13(1), 12–21. <https://jpmsonline.com/article/jpms-volume-13-issue-1-pages12-21-ra/>
- Schanandore, M., Gamston, C. E., Hohmann, L., & colleagues. (2025). Pharmacist confidence, comfort, and experience screening for and addressing social risks. *Journal of the American Pharmacists Association*.
- Valaitis, R. K., Wong, S. T., & MacDonald, M. (2020). Addressing quadruple aims through primary care and public health collaboration: Ten Canadian case studies. *BMC Public Health*, 20, Article 507.
- Walker, R. J., Strom Williams, J., & Egede, L. E. (2016). Influence of race, ethnicity and social determinants of health on diabetes outcomes. *The American Journal of the Medical Sciences*, 351(4), 366–373. <https://doi.org/10.1016/j.amjms.2016.01.008>
- Williams, J. S., Walker, R. J., Peek, M. E., & Chin, M. H. (2023). Integrating medical and social care to reduce diabetes inequities: Lessons from the Bridging the Gap Program. *Journal of General Internal Medicine*. <https://doi.org/10.1007/s11606-022-07977-5>
- World Health Organization. (2010). Framework for action on interprofessional education and collaborative practice. *World Health Organization*. <https://www.who.int/publications/i/item/framework-for-action-on-interprofessional-education-collaborative-practice>
- World Health Organization. (2023). Social determinants of health. <https://www.who.int/health-topics/social-determinants-of-health>
- Wu, D. A., Noël, G. P. J. C., & Wingate, R. (2020). An international partnership of 12 anatomy departments: Improving global health through internationalization of medical education. *Annals of Global Health*, 86(1), 1–8.
- Zwanikken, P. A. C. (2015). Public health and international health educational programmes for low- and middle-income countries: Questioning their outcomes and impact. Maastricht University
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