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SHORT REPORT

Innovations in oral health: A toolkit for interprofessional education

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ABSTRACT

The integration of oral health competencies into non-dental health professions curricula can serve as an effective driver for interprofessional education (IPE). The purpose of this report is to describe a replicable oral-health-driven IPE model and corresponding online toolkit, both of which were developed as part of the *Innovations in Oral Health (IOH): Technology, Instruction, Practice, and Service* programme at Bouvé College of Health Sciences, Northeastern University, USA. Tooth decay is a largely preventable disease that is connected to overall health and wellness, and it affects the majority of adults and a fifth of children in the United States. To prepare all health professionals to address this problem, the IOH model couples programming from the online resource *Smiles for Life: A National Oral Health Curriculum* with experiential learning opportunities designed for undergraduate and graduate students that include simulation-learning (technology), hands-on workshops and didactic sessions (instruction), and opportunities for both cooperative education (practice) and community-based learning (service). The IOH Toolkit provides the means for others to replicate portions of the IOH model or to establish a large-scale IPE initiative that will support the creation of an interprofessional workforce—one equipped with oral health competencies and ready for collaborative practice.

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Introduction

In recent years, a consensus has formed around the idea that patients benefit when interprofessional teams deliver their care, and academic institutions have responded by seeking ways to embed interprofessional education (IPE) within their health professions curricula (Interprofessional Education Collaborative, 2016; World Health Organization, 2010). The practice of integrating oral health competencies into the curricula of non-dental health professions, or *oral health integration*, presents ready opportunities for IPE.

The Centers for Disease Control and Prevention reports that tooth decay—a largely preventable disease—is present in approximately 37% of US children aged 2–8 and 91% of US adults aged 20–64 (Dye, Thornton-Evans, Li, & Iafolla, 2015a, 2015b). A growing body of evidence connecting oral health to systemic health further underscores the urgency of making preventive dental care an essential component of comprehensive healthcare (Institute of Medicine, 2011a, 2011b). IPE experiences that are driven by oral health integration can link the well-being of the mouth to the well-being of the body and prepare students to deliver safe, high-quality care through interprofessional collaborative practice.

The purpose of this article is to describe a replicable IPE model and corresponding online toolkit, both of which were developed as part of the *Innovations in Oral Health (IOH): Technology, Instruction, Practice, and Service* programme at Bouvé College of Health Sciences, Northeastern University (NEU), USA. Creation of the

programme was funded by a grant from the DentaQuest Foundation. In alignment with DentaQuest's *Oral Health 2020* vision 'oral health is essential to lifelong health and well-being', (DentaQuest Foundation, 2013; 'Oral Health 2020', para. 3) the aim of the grant was to broadly promote interprofessional, team-based approaches to oral healthcare by creating and disseminating a national IPE model for oral health integration.

The IPE model developed at NEU specifies the combined use of technology, instruction, practice, and service to facilitate the integration of oral health into any undergraduate or graduate health professions curricula. Curricular modules generated within this framework were pilot-tested and implemented with students and faculty as part of the IOH programme at NEU. The steps taken to implement and evaluate IOH were captured for dissemination through the IOH Toolkit—an online resource that others can use to replicate the model and advance IPE.¹

Activities

Project leaders launched the preliminary phase of the IOH programme by holding multiple events focused on oral health integration. These events were designed to raise awareness of why oral health is important to overall health, to make the case for integrating oral health into health professions curricula, and to forge partnerships in and outside the university around the idea of oral health integration at NEU. Among these events:

- An ‘Oral Health Summit’ convened more than 125 health professionals representing dentistry, medicine, nursing, pharmacy, and public health; and faculty, students, funders, policymakers, and community leaders from across New England to discuss using oral health to advance IPE and collaborative practice.
- The project team established a multilevel leadership infrastructure through which deans and programme directors, faculty, and students could contribute multiple perspectives to support and guide the endeavour.
- Team members surveyed faculty to gauge the climate around IPE and oral health integration at NEU. The survey assessed faculty collaborative skills, knowledge about oral health, attitudes toward IPE, and openness towards oral health integration.
- Programming for faculty development around oral health was created based on the findings. Study findings are presented elsewhere (Dolce, Holloman, & Goodkind, 2016).
- Lastly, the team mapped existing health curricula to determine opportunities to integrate oral health content by partnering with individual faculty members to identify areas in their current curricula where information about oral health already existed and where it could be added.

Educational programming for IOH was developed using *Smiles for Life: A National Oral Health Curriculum*. This online resource for teaching primary care clinicians about oral health across the lifespan is the only curriculum of its kind in the nation and has been endorsed by numerous health-related organisations, including the American Dental Association. This curriculum equips health professionals with the knowledge and skills they need to recognise oral health conditions, assess oral health risks, and participate in preventive activities on behalf of their patients. Because it is online and free of charge, *Smiles for Life’s* flexibility and accessibility made it appealing to IOH project leaders who envisioned the application of high-quality programming across multiple health professions in varied pedagogical settings. Competencies taught using this resource align with the interprofessional competency framework developed by the Interprofessional Education Collaborative Expert Panel (2011) and the core competencies developed by the U.S. Health Resources and Services Administration (2014) report.

Implementation of IOH programming coupled online materials with the kind of experiential learning opportunities that characterise effective IPE. In accordance with the IPE model designed by IOH, programming included distance learning and simulation-learning (technology), hands-on workshops and didactic sessions (instruction), and opportunities for both cooperative education (practice) and community-based learning (service). Simulation-learning prepared students for real-world practice as they safely trained in interprofessional teams to provide comprehensive, person-centred care. Workshops and case-based didactic sessions combined online courses from *Smiles for Life* with hands-on classroom learning for flexible, affordable and effective education. Immersive learning experiences such as cooperative education

and service-learning provided real world experiences in a longitudinal and meaningful way.

Outcomes

The IOH programme at NEU remains strong. Oral health competencies are infused across NEU’s health sciences curricula; a semester-long cooperative education experience offered in partnership with Boston Health Care for the Homeless Program is entering its third year, and a service-learning programme administered monthly through a collaboration between NEU and Harvard School of Dental Medicine continues today. For the latter activity, students from both schools attend an oral health clinic to provide oral health services to a local indigenous community.

To assist faculty and administrators at schools and academic health centres who wish to create similar learning opportunities for students, IOH project leaders created the IOH Toolkit. The toolkit was designed to facilitate replication of the IPE model at the course, programme, or institutional level. This curricular innovation has two aims: contributing to the development of interprofessional collaborative practice competencies in health professions students, and preparing the next generation of health professionals to deliver integrated primary care services that include oral health.

Unlike curricular platforms designed for specific professions, settings, or populations, the IOH Toolkit has broad application. Programming was pilot-tested with students and faculty from 13 different health professions and is appropriate for varied levels of investment: from individual faculty members who want to add an oral health dimension to a course, to administrators seeking ways to embed IPE throughout a school’s health professions curricula. The toolkit offers both high-level guidance and detailed step-by-step instructions for all phases of the integration process, from readiness assessment to curricular implementation. Activities are also adaptable for a range of learners, from entry-level to more advanced, with curricular modules suited to a variety of settings and pedagogical approaches. Chapters include comprehensive lesson plans as well as sample forms, worksheets, and assessments. For a complete outline of chapter content, see [Table 1](#).

To date, a total of 3,958 unique visitors across 72 countries have accessed the IOH Toolkit since its online launch in December 2015. Highest utilisation was noted for Chapter 6. Case-based learning followed by Chapter 5. Simulation learning. Feedback on the toolkit has indicated that it was well organised, easy to implement, and adaptable for varied levels of learners and across health professions.

Discussion

For institutions seeking to advance IPE, oral health integration can serve as an effective driver, even for institutions without an associated dental or medical school. To undertake this effort at NEU, IOH project leaders fostered inter- and intra-institutional collaborations, which resulted in a number of strong community partnerships. For example, the multi-level leadership infrastructure garnered support from deans,

Table 1. Innovations in oral health toolkit table of contents.

Chapter 1. Introducing the IOH Toolkit	This chapter outlines the reasons for creating the IOH toolkit, guidelines for its use, the philosophy and methodology behind the toolkit, and the steps for building a sustainable programme.
Chapter 2. Are You Ready?	This chapter guides you in assessing readiness at your institution; determining a manageable scope for your oral health integration project; and the best way to get your programme off the ground.
Chapter 3. Create Awareness and Secure Support	This chapter describes the steps for launching a campaign that engages major stakeholders and rallies colleagues and students around oral health integration. This chapter also outlines a five-phase community engagement process that includes identifying and engaging leaders, connecting with stakeholders and creating a shared vision, educating colleagues and students about oral health integration, cultivating grass-roots awareness efforts, and securing support from partners.
Chapter 4. Faculty Development	This chapter presents instructor's guides for two workshops designed to help you educate faculty about oral healthcare and oral health integration. These workshops combine online courses with hands-on classroom learning to provide you with flexible, affordable, and effective educational options.
Chapter 5. Simulation Learning	This chapter is the first of four curriculum-based chapters designed to help you engage students and educate them about interprofessional care and oral health integration. In this chapter, you will find instructor's guides that use photographs, models, and role-playing to allow interprofessional groups of students to acquire basic oral health competencies while they practice working as a team with other professionals.
Chapter 6. Case-Based Learning	This chapter offers two case-based didactic learning sessions that introduce students to interprofessional, team-based oral healthcare. These sessions acquaint students with the roles and responsibilities of other health professionals and includes case studies, instructor's guides, and discussion questions. One session is ideal for pre-licensure health sciences students with no clinical training.
Chapter 7. Service-Learning	This chapter will guide you through the process of creating a service-learning programme for your students—from developing community partnerships to integrating service-learning assignments into course syllabi, assignments, grading policies, and more.
Chapter 8. Cooperative Education	This chapter outlines the steps required to create meaningful, semester-long immersion experiences for your students. You'll learn about building community partnerships, how to create student learning objectives and job descriptions, and how to develop educational programming and methods of evaluation.
Web-Based Resources	This list will guide you to additional resources on oral health and interprofessional education.

programme directors, faculty, and staff across multiple institutions, schools, and departments (Dolce, Aghazadeh-Sanai, Mohammed, & Fulmer, 2014). These partnerships were vital to the success of the IOH programme and opened new lines of communication with newly identified IPE and oral-health-integration champions.

One challenge encountered during implementation of the IOH programme was the recognition that *Smiles for Life*

materials are best suited for practicing providers and graduate students. As a result, programming was modified to make the curriculum less medically complex for undergraduate students, especially freshman, who had less background knowledge or experience. These modifications are reflected in the IOH Toolkit. Another challenge that can impede the implementation of IPE initiatives is funding. Collaborators at IOH had financial support from the DentaQuest Foundation, which allowed for the development of an institution-wide initiative and the IOH Toolkit. While the toolkit outlines steps and resources for similar efforts, a range of other activities were designed so that future users can choose to integrate oral health into IPE on a smaller scale that fits their budgets. Because *Smiles for Life* is an open access curriculum, many aspects of the toolkit, such as instructional workshops and case-based didactic sessions, can be implemented at little to no cost.

In summary, implementation of the IOH programme facilitated the advancement of IPE at NEU through oral health integration. Oral health is a lifelong human need that is connected to overall health and wellness, and we believe oral-health-driven IPE can prepare all health professionals to contribute to meeting this need. The IOH Toolkit provides the means for others to replicate portions of the IOH model or to establish a large-scale IPE initiative to support the creation of an interprofessional workforce—one equipped with oral health competencies and ready for collaborative practice.

Note

1. For more information on the toolkit see: <http://www.northeastern.edu/oralhealth/toolkit/>

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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