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Transforming Interprofessional Education: A DIAM-Driven Approach in the Move More Program at a Pro-Bono Student-Led Community Clinic

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Abstract

Background- Unlike many interprofessional education (IPE) programs, which rely on simulation or brief exposure, this study examines a multi-semester, student led community-based clinic providing pro-bono services to stroke survivors. The MoveMore program engages physical therapy and nursing students in real-world interprofessional collaboration with community partners who are individuals living with chronic stroke.
Methods-To ensure continuous quality improvement (QI) and patient-centered care, the students and clinical staff implement the Design-Implement-Assess-Modify Model (DIAM), for multidirectional evaluation and immediate program modifications., adapted from the Plan-Do-Study-Act (PDSA) cycle. Methods utilized a mix of quantitative (Wilcoxon signed rank test) and qualitative data via focus groups.
Results- Four distinct themes emerged that correlate to the Interprofessional Education Collaborative (IPEC) core competencies; Roles & Responsibilities, Communication, Values and ethics, and Team Based care. Through focus group interviews, student insights highlighted how the student-led pro-bono clinic fostered leadership development and teamwork, while the DIAM Model enabled adaptations to address learner needs. Improved orientations, enhanced communication across disciplines, and better clinical decision-making tools were established to ensure quality patient-centered care.
Conclusion-The MoveMore program at this student-led pro-bono clinic demonstrates the value of using a structured QI tool to enhance interprofessional learning.

Introduction

Preparing healthcare students for collaborative practice has become a priority in health professions education due to the well-documented benefits of interprofessional collaboration on patient satisfaction, safety, and care quality.[1,2] Historically, students have been educated in silos of independent coursework. To address this, educational settings have implemented interprofessional education (IPE) to enhance collaboration among future health professionals. Recent reviews have found that most IPE experiences remain brief, and often limited to simulation, with minimal real-world patient interaction.[2,3] Student-led models and sustained, community-based IPE programs are especially lacking in literature. This study addresses these gaps by evaluating a student led, multi-semester, community-based program that utilizes a structured quality improvement framework for developing and evaluating IPE student experiences.[4]

Background

Recent advances in quality improvement frameworks, such as the Institute for Healthcare

Improvement's (IHI) Triple Aim, and now the Quintuple Aim, highlight the need for safe, high-quality, and sustainable patient-centered care for leading transformations in healthcare.[5] Achieving these aims relies on preparing healthcare students to work collaboratively and lead change across health care systems.[5,6,7]

Following the Institute of Medicine's 2003 report, "*Health Professions Education: A Bridge to Quali*ty", national organizations formalized IPE competencies around values and ethics, roles and responsibilities, communication, and teams and teamwork.[8,9] However, evidence suggests a persistent lack of comprehensive and sustained IPE experiences, particularly those fully integrating direct patient care in community settings.[8,9]

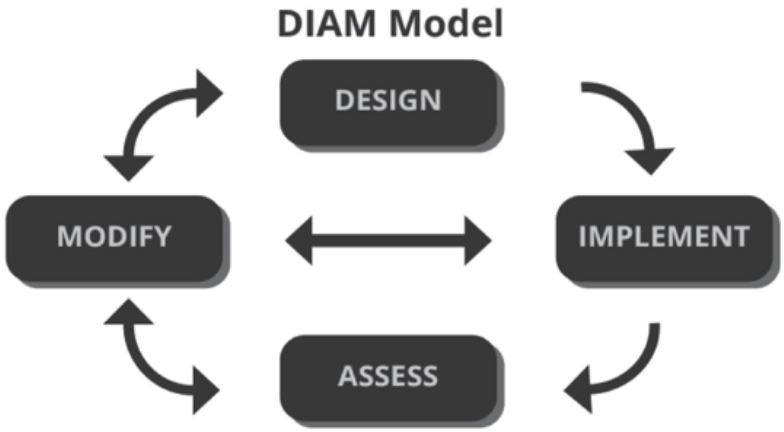
The MoveMore program was developed to address these shortcomings. The MoveMore program was conducted weekly in a pro bono student-led clinic. The program served community partners who have experienced a stroke and wish to improve their endurance and walking ability. Nursing and physical therapy (PT) students delivered this IPE program for 10 to 12 weeks each semester. The program emphasized high-intensity gait training (HIGT) principles and real-world interprofessional collaboration.[10] The community partners frequently faced insurance limitations for traditional physical therapy services.

Conceptual frameworks are recommended for developing, implementing, and evaluating community health programs as well as all IPE programs.[11,12] However, a literature review by Azzam et al. indicated that IPEs often lack sufficient theoretical frameworks.[2] To bridge this gap, the MoveMore program, within the student-run pro-bono clinic, used the Design-Implement-Assess-Modify (DIAM) Model (Figure 1). To ensure ongoing and responsive improvement, the MoveMore program utilized the Design-Implement-Assess-Modify (DIAM) model. The DIAM model is a flexible, iterative adaptation of the Plan-Do-Study-Act (PDSA) cycle, designed specifically for IPE experiences (Figure 1).[13] This framework allows for multidirectional adaptation and greater efficiency in implementing changes.[4] Building on these foundational elements, the MoveMore program incorporated the DIAM model to adapt multiple change points each semester, improving programming and addressing immediate and long-term needs.

Methods

A quality improvement methodology was developed using the DIAM Model's design phase, incorporating direct feedback from students.

Figure 1. *Design-Implement-Assess-Modify (DIAM) Model*



The multi-directional DIAM Model

Participants

The study included Bachelor of Science Nursing (BSN) students and Doctor of Physical Therapy (DPT) students. The BSN students engaged with MoveMore as a requirement for their community nursing course, contributing their insights during a single semester. In contrast, DPT students participated voluntarily for 1 to 7 semesters, allowing for a deeper exploration and observation of changes in their perspectives over time. Typically, two to three DPT students served as leaders during the sessions, providing ongoing guidance to the other student participants throughout the semester and in subsequent semesters. Most of the DPT students volunteered at least six times during the 12-week semester, to enhance the continuity of the program. MoveMore was initially piloted with three community partners and three students in March-April 2022. Since then, it has been delivered in four subsequent semesters (Spring/Summer 2022, Fall 2022, Winter 2023, Spring/Summer 2023) for approximately 12 weeks each.

Intervention

The "implementation phase" of the DIAM Model occurred during the MoveMore sessions, timed to the university's academic semester. MoveMore has a one-hour duration at a student-led pro-bono community clinic on Fridays. The class runs for 12 weeks in the fall and winter semesters and 10 weeks in the spring/summer semester. Students engaged in MoveMore work in interprofessional groups with community partners, monitoring vital signs, delivering walking training at a moderate to high cardiovascular intensity, and maintaining safety while demonstrating interprofessional collaborative healthcare characteristics.

Data Collection

Student participants were surveyed at the beginning and end of each MoveMore session. Student focus groups (BSN and DPT) were conducted at the end of each session. Focus group questions are included as the Appendix. One of the researchers trained in debriefing techniques facilitated the focus group interviews. Each session lasted approximately 30 minutes, and a standard set of questions was utilized. Sometimes called an after-action review, this debriefing method focuses on the recent experience, what happened, and opportunities for improvement.[14,15] The focus group participants were asked to discuss and provide "real-time" feedback on educational experiences, communication, values, teamwork, and suggestions for future improvements.

This study utilized the Interprofessional Education Collaborative Competency Self-Assessment Tool (IPEC-SAT), version 3, to assess competencies related to collaborative practice among participants.[16,17] The tool was administered before and after the intervention to measure any changes in competency levels. Following the assessment with the IPEC-SAT, three additional questions (Table 1) utilizing a 0-100 sliding scale were used to assess the perceived importance, comfort, and likelihood of using high-intensity gait training (HIGT). The project protocol was approved as exempt by the university's Institutional Review Board.

Data Analysis

Progressing into the DIAM Model's "assess phase, "qualitative data from focus groups, the

Table 1. Student and Community Patient Partner Participation

Semester/Year	BSN Students	DPT Students	Community Partners
Fall 2022	12	18	8
Winter 2023	9	25	12
Spring/Summer 2023	10	24	18

A review of all participants involved. BSN: Bachelor of Science in Nursing; DPT: Doctor of Physical Therapy

Table 2. Significance Wilcoxon Signed Rank Test

Question	Profession	Sample N	P - value
How important is high intensity gait training (HIGT) for patients that have sustained a stroke?	ALL	19	0.18
	BSN	12	0.24
	DPT	7	0.41
How comfortable are you in providing safe high intensity gait training (HIGT) for a patient that has sustained a stroke?	ALL	19	0.01*
	BSN	12	0.03*
	DPT	7	0.13
What is your likelihood of providing and encouraging high intensity gait training (HIGT) for a patient that has sustained a stroke?	ALL	19	1.0
	BSN	12	0.59
	DPT	7	0.95

Additional questions to students about their experiences in the program. Categories of student professions BSN: Bachelor of Science in Nursing; DPT: Doctor of Physical Therapy; ALL: indicates both BSN and DPT students.
**Indicates statistical significance*

IPEC-SAT, and three additional survey questions (pre and post intervention) were asked on the importance, comfort, and likelihood of using HIGT were analyzed (Table 2). A p-value for statistical significance was <.05 a priori. Data was analyzed using Wilcoxon signed rank tests in SPSS (version 26, IBM, Armonk, NY). The focus groups were not recorded, but the facilitator took detailed notes on the feedback provided. Three researchers involved in the study reviewed the focus group feedback and independently determined significant themes. Then, the researchers came together to compare their identified themes and reviewed and discussed discrepancies until a consensus was reached.

Results

Participants

Over three semesters, a total of 19 students (12 BSN and 7 DPT) completed both pre- and post-intervention surveys; only matched, complete responses were included in the analysis. The demographic distribution further revealed that 16 students (84.2%) identified as female, while two identified as male, and one preferred not to disclose their gender. The mean age of the participants was 28.2 years. Regarding racial backgrounds, 14 students (73.7%) identified as white, one as Asian, two as African American, and one as Hispanic. The overall response rate in the fall was 26.7%; in the winter, it was 11.8%; and in the spring, it was 20.6%.

Focus Group Summary

Four distinct themes emerged that correlated to the IPEC core competencies, and a summary statement of the feedback follows:

1. Roles and responsibilities: Students described how working together from the second week onward fostered a sense of camaraderie and equality within the team. Nursing students often volunteered their strengths and areas for growth, while PT students took initiative in care planning and patient mobility. Several groups observed that openly sharing tasks, such as alternating who measured vital signs, helped everyone develop new competencies and feel more included.
2. Communication: Participants highlighted how communication evolved over time. Some nurses expressed initial apprehension about voicing concerns, particularly regarding vital signs or medication, but reported increased confidence as they developed rapport within the

group. Students found that initiating icebreaker activities, exchanging phone numbers, and communicating outside of the clinic helped build trust and streamline their collaboration.

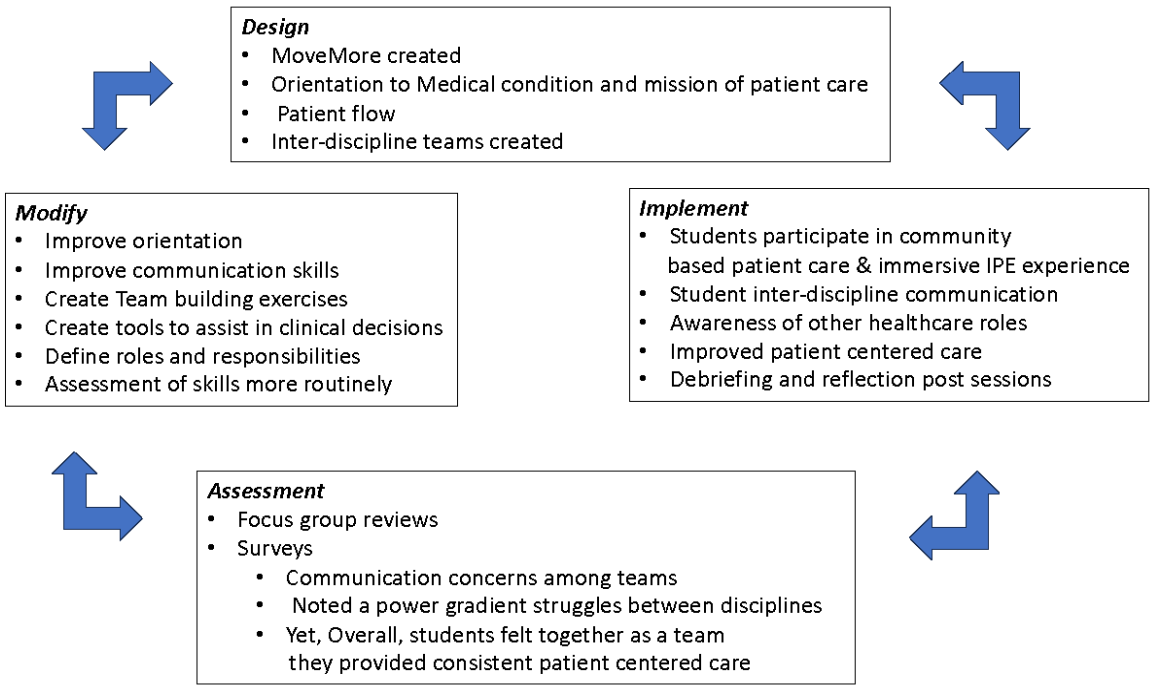
3. Values and ethics: Early sessions were marked by uncertainty around hierarchy and role divisions, such as who should assume leadership during activities. As the semester progressed, students found themselves less concerned about who was "in charge" and more focused on meeting patient needs collaboratively. Many reflected that these experiences promoted ethical growth, particularly in advocating for patient safety and recognizing the value in each team member's contribution.
4. Team-based care: Across all semesters, students recognized the advantages of team-based care, both for patient outcomes and for their own learning. PT students often relied on RN students for medication and vital sign expertise, while nursing students appreciated learning new patient mobility skills from PT peers. Many students believed that working as a team led to better patient performance and a more motivating environment. Challenges such as role confusion or noisy, shared spaces highlighted the need for clearer orientation and defined responsibilities.

Overall, the students found the MoveMore experience highly beneficial, noting that it increased both their skills and confidence in interprofessional teamwork. Many recommended that future iterations of the program include even more structured orientation and more opportunities to collaborate across disciplines.

DIAM Model Summary

Figure 2 illustrates the program's design, implementation, evaluations, and modifications guided by the DIAM model over 3 semesters. Each term, the model supported targeted improvements such as enhanced orientation processes and the use of clinical decision-making tools and algorithms. To streamline workflow and promote quality care, laminated quick-reference aids were

Figure 2. *MoveMore summary utilizing the Design-Implement-Assess-Modify (DIAM) Model*



A summary of the DIAM Model in this program.

included in the patient charts alongside algorithms addressing elevated blood pressure parameters. For example, students often discovered that a community partner had not taken their medication before visiting the clinic, highlighting a crucial element of safe, quality, patient-centered care. To strengthen team communication and address power dynamics, we implemented mini-leadership sessions and regular huddles within DPT/BSN student groups. Clear roles and responsibilities were defined, and lessons on self-empowerment, patient advocacy, and quality of care were continuously emphasized at multiple touchpoints.

Survey

Analysis of the IPEC-SAT (version 3) showed no significant differences between pre-intervention and post-intervention scores, and thus detailed statistical data are not included. Assessment questions about HIGT were useful for evaluating students' proficiency in core content relevant to patient outcomes. While analysis using the Wilcoxon signed-rank test revealed a statistically significant increase in BSN students' comfort providing safe HIGT to stroke patients ($p = 0.03$), the small sample size affects a reliable post hoc analysis.

Discussion

This evaluation of the MoveMore program demonstrates how sustained, student-led, community-based IPE can bridge critical gaps left by conventional, short-term, or simulated models.[1-3] Unlike most IPE experiences, MoveMore allowed nursing and physical therapy students to engage in ongoing, real-world collaboration with community partners and directly applying classroom concepts to complex patient needs. The DIAM quality improvement model was central to these processes, enabling program adjustments in response to feedback from students, faculty, and community partners.

Qualitative data from focus groups revealed meaningful interprofessional growth among participants. Students described building cross-disciplinary communication skills and developing greater confidence through peer modeling, teamwork, and shared responsibility for patient care. Such experiences underscore the ability of a structured quality improvement (QI) framework like DIAM to foster interprofessional trust, support autonomous clinical decision-making, and empower students to contribute meaningfully to patient outcomes.

The lack of meaningful change on the IPEC-SAT is likely attributed to ceiling effects and the small sample size (n=19), which limits the ability to detect incremental growth in collaborative competencies. Given these constraints, the IPEC-SAT was not sensitive to the more nuanced developments in interprofessional practice that occurred, as supported by focus group feedback. In contrast, responses to the high-intensity gait training (HIGT) survey questions provided more actionable insight. Notably, there was a statistically significant increase in BSN students' comfort with providing safe HIGT to stroke survivors ($p=.03$), suggesting that targeted content and repeated practice may enhance specific clinical competencies, even in a small cohort. The qualitative data from post-session focus groups offered the richest feedback, revealing gains in communication, confidence, and collaborative decision-making, outcomes that were not fully captured by the IPEC-SAT assessment alone.

The student-led, pro bono model was foundational to the program's success, offering distinct opportunities for growth that extended beyond clinical knowledge. Without constant faculty direction, students were required to initiate and manage interprofessional discussions themselves, which fostered greater communication autonomy, independence, and teamwork. Operating within the typical constraints of a pro bono clinic, students also learned to collaborate creatively, share limited resources, and flexibly adapt clinical protocols, developing practical skills essential for real-world healthcare delivery.

The MoveMore experience suggests that sustained, student-led programs, where students' feedback help to shape and modify processes using structured QI approaches, not only foster better teamwork and leadership but also offer a viable template for other community-focused IPE efforts.

These programs are uniquely positioned to address real health equity issues by serving populations facing insurance, financial, or access barriers.

Student-Led Clinic

The MoveMore program was implemented within a student-run pro bono community clinic. The student-led nature of the clinic afforded participating students a high degree of communication autonomy, fostering direct and frequent interprofessional dialogue without reliance on constant faculty oversight. This autonomy encouraged real-time problem solving and facilitated independent clinical decision-making.

Leadership development was embedded in the clinic structure, with two to three DPT students as leaders, responsible for organizing care activities, coordinating between disciplines, and guiding peers in interprofessional practices. This exposure to leadership and management roles allowed students to develop confidence and skills essential for future professional practice.

Operating in pro-bono, student-led environment presented unique resource limitations, including reliance on donated supplies and equipment, volunteer time, and the need to adapt to infrastructural challenges posed by operating in an old school building. Students were key agents in resource management, often required to adapt program activities or patient care based on available equipment and clinic conditions.

Future/Sustainability of the Program

This program's operations have been funded through grants and philanthropic donations. Its value should be understood through its overall success stories from students, patients, and the quality of care provided. Academia and healthcare programs must identify sustainable methods to maintain initiatives like MoveMore. This program offers cost-effective benefits and provider satisfaction, reflecting improved health outcomes for MoveMore community partners who are living with chronic stroke.

Limitations

The limited sample size, especially of DPT students beyond one semester, presents a limitation and highlights the need for more extensive recruitment strategies and ongoing engagement to ensure richer, more diverse data in future studies. While insights from instructors, faculty clinicians, and community partners were crucial to the program's success and offered valuable perspectives on interprofessional education, this paper primarily focuses on student feedback. Future research should strive to integrate and analyze contributions of all stakeholders to provide a more comprehensive evaluation of the program's impact.

Limitation of the survey IPEC-SAT, version 3, showed no significant difference between pre- and post-survey. Further review of different surveys may benefit further research. The varying levels of participation and extended engagement by DPT students, many of whom attended multiple semesters, may have influenced survey results. Data analyses using the Wilcoxon signed-rank test were conducted to capture changes in competencies. While significant findings emerged in specific domains, future research with larger sample sizes should further validate these outcomes.

Focus group discussions were not audio recorded, as a result, we are unable to present direct verbatim quotations from participants. While the thematic analysis reflects the breadth of student experiences, the absence of direct quotes may limit the depth and richness of the narrative. Future studies should consider audio recording focus group interviews to enable inclusion of participant quotes and deepen qualitative analysis.

Conclusion

The DIAM Model provided a pathway for immediate feedback and change. This project evalu-

ated the effectiveness of a community-engaged, multi-semester IPE within a student-led pro bono health clinic. MoveMore was purposely designed to incorporate IPEC core competencies, with the DIAM Model facilitating multidirectional evaluation and immediate modification. The immersive program aligns with best practice recommendations for IPE and challenges norms of most IPE experiences. Community partners present real-life variables that impact patient care outcomes. Students benefit from extended IPE experiences, forming bonds with interprofessional teams and community partners, which enhances problem-solving and team reliance. Students provide feedback and constructive suggestions for change. The IPE student-led pro bono clinic offers a robust template for future IPE endeavors by addressing gaps and leveraging feedback from diverse stakeholders. With the DIAM Model, students gain a conceptual roadmap. The results of this evaluation underscore the need for further research in student-led IPE programs utilizing the DIAM model.

Disclosures

The authors are solely responsible for content in this article and have no conflict of interest.

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