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Team-Based Learning and Collaborative Practice Education Across Distributed Healthcare Training Sites: A Scoping Review Protocol

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Abstract

Introduction**:** Interprofessional education (IPE), where students from multiple professions learn about, from, and with each other, is vital for training healthcare professionals in team-based care. Worldwide, accreditation bodies require IPE competencies. Nonetheless, implementing IPE in distributed academic health systems faces challenges: coordinating learners across distant sites, ensuring uniform competency development, managing logistical complexity, balancing standardization with local adaptation, and utilizing technology while fostering genuine collaboration. Data indicates that distributed systems have about 40% lower IPE participation at satellite locations, with notable differences in competency achievement. Despite IPE's significance, there is limited systematic evidence on effective IPE strategies specifically suited for distributed settings.

Purpose: This scoping review systematically explores interprofessional education models and team-based learning strategies within distributed healthcare education systems. It assesses their design, implementation methods, IPEC competency evaluation across four core domains, and the reported outcomes.

Methods: This review follows Arksey and O'Malley's framework with Levac's enhancements and adheres to PRISMA-ScR guidelines. It will include studies that describe IPE initiatives carried out across various geographically spread healthcare education sites. Eligible studies must involve learners from at least two different health professions engaged in active collaborative learning and report outcomes related to IPEC competencies, the feasibility of implementation, or educational impacts. A thorough search will be conducted across seven databases and grey literature to support a narrative synthesis. Data extraction will utilize the IPEC competency framework, with emphasis ratings from 0 to 3, and Reeves' IPE typology—exposure, immersion, and mastery—allowing for cross-framework analysis to identify the most effective IPE strategies for achieving specific competency development objectives.

Guidelines

- PRISMA Extension for Scoping Reviews (PRISMA-ScR) Checklist
- Arksey and O'Malley Scoping Review Framework with Levac refinements
- PRESS (Peer Review of Electronic Search Strategies) guidelines
- IPEC (Interprofessional Education Collaborative) Core Competency Framework (2016, updated 2023)
- Reeves' IPE Typology (2016) for classifying IPE activities

Materials

- Computers with an internet connection
- Reference management software (Mendeley/EndNote/Zotero)
- Covidence systematic review software for screening and data management
- Microsoft Word and Excel for data extraction and analysis
- Statistical software for descriptive analysis (SPSS/R/Stata)

Safety warnings

This review considers IPE delivered through technology—such as synchronous virtual sessions, online collaborative platforms, and simulation technology—when it aligns with the core definition of interprofessional education (learning about, from, and with other professions through interactive collaboration). Although there is debate about the authenticity of virtual interprofessional collaboration, we include technology-mediated IPE because of its importance in distributed systems. We will also describe and compare the outcomes of virtual, in-person, and hybrid modalities.

Ethics statement

This study is a scoping review of published and publicly available literature and does not involve the collection of primary data from human participants. As such, it does not require ethics approval according to our institution's guidelines. All data sources will be appropriately cited and acknowledged.

Objectives

1 Explore interprofessional education (IPE) models and team-based learning strategies used in distributed healthcare education systems.

1.1 Identify types of IPE activities (exposure, immersion, mastery-based) implemented in distributed healthcare education systems and which health professions are involved.

1.2 Describe delivery modalities used for distributed IPE (in-person, synchronous virtual, asynchronous online, hybrid, simulation-based) and how technology enables IPE across geographically dispersed sites.

1.3 Examine which IPEC core competency domains (Values/Ethics, Roles/Responsibilities, Communication, Teams/Teamwork) are addressed by different IPE models.

1.4 Analyze how IPEC core competencies are assessed in distributed IPE initiatives and what assessment methods are used.

1.5 Identify implementation strategies that address logistical, educational, and collaboration challenges of IPE in distributed settings.

1.6 Identify barriers and facilitators influencing IPE implementation, quality, and sustainability in distributed healthcare education systems.

1.7 Examine equity of IPE access and outcomes between main campus and distributed sites.

Methodology Overview

2 Follow the methodological framework established by Arksey and O'Malley (2005), incorporating enhancements recommended by Levac et al. (2010).

3 Adhere to the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews) guidelines.

4 Develop and register the protocol on protocols.io.

5 Use IPEC (Interprofessional Education Collaborative) Core Competency Framework to identify competencies addressed and organize outcomes.

6 Use Reeves' IPE Typology (exposure, immersion, mastery) to classify IPE activities by intensity.

7 Conduct cross-framework analysis examining whether certain IPE activity types (Reeves) are more effective at developing specific IPEC competency domains.

Stage 1: Identify the research questions

8 Primary Research Question

8.1 What interprofessional education models and team-based learning strategies are used in distributed healthcare education systems, which IPEC competency domains do they address, and what outcomes are reported regarding learner competencies, implementation feasibility, and educational impact?

9 Secondary Research Questions

- What types of IPE activities (exposure, immersion, mastery-based) are implemented in distributed healthcare education systems, and which health professions are involved?
- What delivery modalities are used for distributed IPE, and how does technology enable IPE across geographically dispersed sites?
- How are IPEC core competencies assessed in distributed IPE initiatives, and what assessment methods are used?
- What implementation strategies address the logistical, educational, and collaboration challenges of IPE in distributed settings?
- What barriers and facilitators influence IPE implementation, quality, and sustainability in distributed healthcare education systems?
- What evidence exists regarding equity of IPE access and outcomes between main campus and distributed sites?

Stage 2: Identify relevant studies

10 Databases: PubMed/MEDLINE, Embase, Scopus, CINAHL, Web of Science, ERIC, Google Scholar (first 200 results), grey literature sources.

11 Create the search strategy using three core concepts:

11.1 Concept 1 (Interprofessional Education):

Interprofessional education, IPE, inter-professional education, interprofessional learning, interprofessional training, interprofessional collaboration, collaborative practice education, team-based learning, interprofessional curriculum, IPEC, interdisciplinary education, virtual IPE, online interprofessional, tele-IPE

11.2 Concept 2 (Distributed Setting):

Multi-site, distributed, multi-campus, decentralized, networked, regional campus, satellite campus, community-based education, rural training, remote sites, geographically dispersed, multiple sites, virtual education, online education, distance learning, academic health system, clinical training network

11.3 Concept 3 (Healthcare Education):

Medical education, health professions education, nursing education, healthcare education, clinical education, pharmacy education, allied health education, dental education, health sciences education, students, trainees, residents, learners

12 Adapt the search strategy for each database using appropriate controlled vocabulary (MeSH, Emtree) and syntax.

13 Sample PubMed Search Strategy:

(("interprofessional education" OR "IPE" OR "interprofessional learning" OR "collaborative practice education" OR "team-based learning" OR "interprofessional curriculum" OR
"IPEC" OR "virtual IPE" OR "online interprofessional")
AND
("multi-site" OR "distributed" OR "multi-campus" OR "regional campus" OR "satellite campus" OR
"community-based education" OR "rural training" OR "geographically dispersed" OR "virtual education" OR "academic health system")
AND
("medical education"[MeSH] OR "health professions education" OR "nursing education" OR
"healthcare education" OR "students" OR "trainees"))
AND
(2015:2025[dp])

14 Manually search grey literature including IPE-specific sources (National Center for Interprofessional Practice and Education, CAIPE), conference proceedings (All Together Better Health, AMEE, AAMC), MedEdPORTAL.

Stage 3: Study selection

15 Include studies involving healthcare professions students/trainees from minimum two health professions engaged in interprofessional education across multiple geographically dispersed sites.

16 Include studies describing IPE implementation that addresses distributed-specific aspects: specifically designed for distributed contexts, compares implementation/outcomes across sites, describes adaptations for distributed settings, or discusses coordination challenges.

17 Include studies where learners from different professions engage in active collaborative learning through shared activities requiring interaction, joint problem-solving, collaborative projects/simulations, or interprofessional team-based activities.

18 Include studies reporting outcomes related to: (a) IPEC competencies (knowledge, attitudes, skills, behaviors), (b) implementation outcomes (feasibility, acceptability, fidelity, reach, sustainability), (c) educational outcomes (satisfaction, learning, behavior change), (d) clinical/system outcomes.

19 Include studies focusing on health professions education (medicine, nursing, allied health, pharmacy, dentistry, public health, social work, psychology).

20 Include studies employing any research design (quantitative, qualitative, mixed-methods, program descriptions).

21 Include grey literature sources such as conference proceedings, dissertations, and organizational reports if they provide sufficient methodological information.

22 Exclude single-site IPE without multi-site implementation or distributed considerations.

23 Exclude generic IPE that coincidentally occurs in multi-site system without addressing distributed-specific implementation.

24 Exclude uniprofessional education (single profession only).

25 Exclude multiprofessional education where professions learn separately without collaborative interaction

Decision rule: "Are learners from different professions required to interact, communicate, and collaborate?" If NO, exclude.

26 Exclude interprofessional practice in clinical settings without educational component.

27 Exclude opinion pieces, commentaries, or editorials without empirical data.

28 Exclude studies that are in a non-English language.

29 Exclude studies published before 2015.

Stage 4: Data Charting

30 Develop the data extraction form using a tiered approach:
- Tier 1 (all studies) captures core variables
- Tier 2 (purposive subset 30-40%) captures detailed implementation.

30.1 Study Identification

- Study ID, authors, year, country
- Study design and methodology
- System characteristics (number of sites, site types, geographic distribution, governance)
- Learner characteristics (professions involved, learner level, sample size)

30.2 IPE Model Characteristics

- IPE Classification (Reeves' Typology): Exposure-based / Immersion-based / Mastery-based / Mixed
- IPE activity type and brief description
- Duration and intensity
- Delivery modality: In-person / Synchronous virtual / Asynchronous online / Hybrid / Simulation / Clinical / Community / Other
- Technology platforms used and the role of technology

30.3 IPEC Competency Domains Addressed

Rate emphasis for EACH domain using a 0-3 scale:
- 0 = Not addressed
- 1 = Mentioned/Implicit (relevant but not explicitly targeted)
- 2 = Addressed (explicitly in objectives/activities)
- 3 = Primary focus (central to design with explicit objectives AND assessment)

For each domain, rate emphasis:

- Values/Ethics for Interprofessional Practice: [0/1/2/3]
- Roles/Responsibilities: [0/1/2/3]
- Interprofessional Communication: [0/1/2/3]
- Teams and Teamwork: [0/1/2/3]

30.4 Distributed-Specific Features

- Explicitly designed for a distributed context (Y/N)
- Addresses coordination across sites (Y/N)
- Compares outcomes across site types (Y/N)
- Discusses equity across sites (Y/N)

30.5 Outcomes Reported

- IPEC Competency Outcomes: For EACH domain outcome: measurement method, timing, direction of findings, statistical significance
- Implementation Outcomes: Feasibility, acceptability, fidelity, reach, sustainability
- Educational Outcomes: Satisfaction, knowledge gains, skill development, attitude changes, behavior changes
- Clinical/System Outcomes: Patient outcomes, team performance, care quality

30.6 Assessment Methods (Tier 2 - Detailed Subset)

- Assessment methods used
- Validated instruments (ICCAS, RIPLS, IPEC Self-Assessment, SPICE, AITCS, other)
- Assessment timing
- Standardization across sites
- Reliability/validity evidence

30.7 Implementation Strategies (Tier 2)

- Curriculum integration approach
- Facilitation approach
- Logistics and coordination mechanisms
- Technology integration specifics
- Faculty development for IPE

30.8 Barriers and Facilitators (Tier 2)

- Barriers by category (logistical, educational, technology, cultural, learner, site-specific)
- Facilitators by category
- Implementation strategies used

30.9 Equity Considerations (Tier 2)

- Access equity (participation rates by site type)
- Outcome equity (competency achievement by site type)
- Resource equity (distribution across sites)

30.10 Quality Indicators

- Theoretical framework used (IPEC / Other IPE framework / None)
- Outcomes systematically measured (Y/N)
- Comparison across sites (Y/N)
- Context adequately described (Y/N)
- Limitations acknowledged (Y/N)

31 Conduct IPEC domain rating calibration: extractors complete a training exercise rating 10 sample studies, compare ratings, discuss discrepancies, and refine understanding.

32 Pilot the data extraction form on 10 studies and refine based on team consensus.

33 Two reviewers will independently extract 20% of studies; remaining extracted by single reviewers with 10% quality checks.

Stage 5: Collate, summarize, and report the results

34 Compile, summarize, and present extracted data using tables, figures, and visual formats.

35 Conduct narrative synthesis organized by:
(a) IPE models mapping (Reeves typology)
(b) IPEC competency coverage analysis
(c) Cross-framework analysis (Reeves × IPEC)
(d) Technology integration analysis
(e) Assessment methods synthesis
(f) Implementation strategies
(g) Outcomes synthesis
(h) Equity analysis
(i) Barriers and facilitators.

36 Create an IPEC competency coverage heatmap showing:

IPE model types × IPEC domains × average emphasis rating.

37 Develop cross-framework visualization:

Bubble chart plotting Reeves type × IPEC domain × emphasis × number of studies.

38 Create a profession network diagram showing which professions commonly learn together.

39 Develop a conceptual model for distributed IPE implementation.

40 Identify knowledge gaps and promising practices.

Stage 6 (Optional): Conduct Stakeholder Consultation

41 Engage IPE experts to review IPEC framework application, domain rating calibration, and cross-framework analysis approach.

42 Consult with Dubai Health Flex Campus Network stakeholders to ensure relevance to distributed IPE implementation challenges.

Dissemination

43 Submit the final manuscript to a peer-reviewed journal specializing in interprofessional education or medical education (target: JMIR Medical Education, Journal of Interprofessional Care, Medical Education, BMC Medical Education, Academic Medicine).

44 Present key results at leading IPE and medical education conferences (All Together Better Health, CAIPE, AMEE, AAMC, ICRE).

45 Develop practical toolkit for implementing IPE in distributed systems with decision-making guide matching IPE models to competency goals.

46 Collaborate with IPEC organization for broader dissemination.

Timeline

47 Month 1: Protocol registration, pilot search validation, extraction form development, IPEC rating calibration
Months 1-2: Database searches and citation management

Months 3-4: Title/abstract screening
Months 4-5: Full-text screening and subset identification
Months 6-8: Tier 1 data extraction, including IPEC ratings
Months 7-9: Tier 2 detailed subset extraction
Month 8: Mid-extraction calibration meeting, IPEC rating consistency review
Months 10-11: Data synthesis, cross-framework analysis, framework development, visuals
Months 11-12: Manuscript preparation and submission

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