Oct 11, 2025

# Strategies for Scaling Educational Innovations Across Multi-Site Healthcare Education Networks: A Scoping Review Protocol

DOI
https://dx.doi.org/10.17504/protocols.io.8epv5kmd5v1b/v1

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**DOI:** https://dx.doi.org/10.17504/protocols.io.8epv5kmd5v1b/v1

**Protocol Citation:** Sara Kazim, Wail Bamadhaf, Zeyad Alrais, Aysha Alsharhan, Jukha Shater Al Marzooqi, Khadija Mohd AlSulaimi, Mersiha Kovacevic, Raed Rafeh, Nabil Zary 2025. Strategies for Scaling Educational Innovations Across Multi-Site Healthcare Education Networks: A Scoping Review Protocol. **protocols.io** https://dx.doi.org/10.17504/protocols.io.8epv5kmd5v1b/v1



**Protocol status:** Working
**We use this protocol and it's working**

**Created:** October 11, 2025

**Last Modified:** October 11, 2025

**Protocol Integer ID:** 229577

**Keywords:** implementation science, educational innovation, distributed education, multi-campus, academic health systems, scaling, RE-AIM, CFIR, implementation strategies, educational innovations within healthcare, scaling educational innovation, strategies for scaling educational innovation, implementation of educational innovation, distributed healthcare education, awareness of implementation science framework, distributed healthcare education network, multiple healthcare education site, healthcare education network, implementation science framework, healthcare education system, strategies from implementation science, innovations such as competency, healthcare education site, element of implementation science, systematic implementation strategy, based innovation, lack of systematic implementation strategy, innovation, implementation science taxonomy, healthcare education, interprofessional education, based education, scoping review protocol introduction, facilitator, implementing evidence, existing knowledge gap, syste

## Abstract

Introduction: Healthcare education systems are increasingly implementing evidence-based innovations such as competency-based education, simulation, technology-enhanced instruction, and interprofessional education. However, expanding these innovations to multiple geographically dispersed sites faces several challenges. Research indicates that less than 30% of educational innovations are successfully scaled across distributed networks, mainly due to a lack of systematic implementation strategies, insufficient guidance on adaptation, inadequate fidelity monitoring, and limited sustainability planning. Although awareness of implementation science frameworks like RE-AIM, CFIR, and EPIS is growing, their systematic use in scaling educational innovations within healthcare remains underexplored.

Purpose: This scoping review explores the frameworks and strategies from implementation science employed to expand educational innovations within distributed healthcare education networks. It highlights existing knowledge gaps and helps guide evidence-based scaling methods.

Methods: Following Arksey and O'Malley's framework, enhanced by Levac's refinements, and adhering to PRISMA-ScR guidelines, the review will encompass studies detailing the implementation of educational innovations across multiple healthcare education sites. Eligible studies must include at least one element of implementation science, such as framework application, strategies, outcomes, barriers/facilitators, or fidelity and adaptation methods. A thorough search will be conducted across seven databases, supplemented by grey literature, to facilitate a narrative synthesis organized according to implementation science taxonomies—Powell for strategies, Proctor for outcomes, and CFIR for context.

## 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
- Powell et al. (2015) implementation strategies taxonomy
- Proctor et al. (2011) implementation outcomes framework
- CFIR (Consolidated Framework for Implementation Research)

## Materials

- Computers with 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)

## Objectives

1 Explore how implementation science frameworks and strategies support the scaling of educational innovations across distributed academic health systems.

1.1 Identify implementation science frameworks used to guide educational innovation scaling (RE-AIM, CFIR, EPIS, i-PARIHS, others).

1.2 Describe implementation strategies employed during adoption, implementation, and sustainment phases (using Powell et al. taxonomy).

1.3 Analyze implementation outcomes reported (using Proctor et al. taxonomy: acceptability, adoption, appropriateness, feasibility, fidelity, cost, penetration, sustainability).

1.4 Examine fidelity and adaptation approaches for scaling educational innovations.

1.5 Identify barriers and facilitators to educational innovation scaling in distributed healthcare education systems.

## 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 Search strategy will follow PRESS (Peer Review of Electronic Search Strategies) guidelines and be validated by a research librarian.

## Stage 1: Identify the research questions

6 Primary Research Question

6.1 What implementation science frameworks guide the scaling of educational innovations across distributed academic health systems, and what implementation strategies are employed during adoption, implementation, and sustainment phases?

7 Secondary Research Questions

7.1
- What types of educational innovations (curricular, pedagogical, assessment, technology) have been scaled across distributed healthcare education networks?
- What implementation outcomes (using Proctor et al. taxonomy) are reported when scaling educational innovations, and how are they measured?
- How do scaling initiatives address the balance between fidelity to core innovation components and adaptation to local contexts?
- What measures of implementation fidelity and adaptation are reported when scaling educational innovations across distributed sites?
- What contextual factors (using CFIR domains) facilitate or impede the scaling of educational innovations across distributed healthcare education systems?

## Stage 2: Identify relevant studies

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

9 Create the search strategy using three core concepts:

9.1 Concept 1 (Innovation & Implementation):

Educational innovation + implementation science terms (curriculum innovation, competency-based education, simulation, technology-enhanced learning, IPE, assessment innovation) AND (implementation science, scaling, spread, dissemination, adoption, RE-AIM, CFIR, EPIS, i-PARIHS, implementation strategies)

9.2 Concept 2 (Distributed Setting):

Multi-site, distributed, multi-campus, decentralized, networked, regional, satellite campus, clinical training network, academic health system

9.3 Concept 3 (Healthcare Education):

Medical education, health professions education, nursing education, healthcare education, clinical education, allied health education

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

11 Sample PubMed Search Strategy:

((implementation science OR implementation framework OR RE-AIM OR CFIR OR EPIS OR scaling OR spread OR dissemination OR adoption OR implementation strategies)
AND
(educational innovation OR curriculum innovation OR competency-based education OR simulation-based learning OR technology-enhanced learning OR interprofessional education))
AND
(multi-site OR distributed OR multi-campus OR academic health system)
AND
(medical education OR health professions education OR healthcare education)
AND
(2015:2025[dp])

12 Manually search grey literature, including conference proceedings (AMEE, AAMC, ICRE), MedEdPORTAL, and organizational reports.

## Stage 3: Study selection

13 Include studies involving healthcare education stakeholders (learners, faculty, educational leaders, implementation teams) across multiple geographically dispersed training sites.

14 Include studies that describe implementation processes for scaling educational innovations across multiple sites within healthcare education systems.

15 Include studies that report at least ONE implementation science element:

(a) Explicit use of implementation framework(s)
(b) Description of implementation strategies (Powell taxonomy)
(c) Assessment of implementation outcomes (Proctor taxonomy)
(d) Systematic analysis of barriers/facilitators
(e) Documentation of fidelity vs. adaptation approaches.

16 Include studies focusing on health professions education (medicine, nursing, allied health, pharmacy, dentistry, public health).

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

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

19 Exclude studies reporting only educational outcomes (exam scores, competency achievement) WITHOUT describing implementation processes.

20 Exclude single-site innovation pilots without multi-site scaling discussion.

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

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

23 Exclude studies published before 2015.

## Stage 4: Data Charting

24 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.

24.1 Study Identification

- Study ID, authors, year, country
- Study design and methodology
- Setting characteristics (number of sites, site types, governance)
- Sample size and participants

24.2 Innovation Characteristics

- Innovation type (curricular, pedagogical, assessment, technology, interprofessional)
- Innovation description
- Target learner population
- Evidence base for innovation

24.3 Implementation Science Framework

- Framework(s) used (RE-AIM, CFIR, EPIS, i-PARIHS, other, none)
- How the framework guided implementation

- Framework domains addressed
- Framework completeness

24.4 Implementation Strategies (Powell et al. 2015)

- Specific strategies employed (coded to 73-strategy taxonomy)
- Strategy categories and timing (pre, during, post-implementation)
- Actor responsible
- Rationale and tailoring

24.5 Implementation Outcomes (Proctor et al. 2011)

- For EACH outcome: type (acceptability, adoption, appropriateness, feasibility, fidelity, cost, penetration, sustainability)
- Measurement method and timing
- Results and statistical significance

24.6 Fidelity and Adaptation

- Core components defined (Y/N)
- Fidelity assessed (Y/N) and measurement approach
- Adaptations made and rationale
- Framework for guiding adaptation

24.7 Context (CFIR Domains)

- Innovation characteristics
- Outer setting factors
- Inner setting factors
- Individual characteristics
- Process factors

24.8 Barriers and Facilitators

- Implementation barriers (CFIR domain coding)
- Implementation facilitators
- Strategies to address barriers

24.9 Sustainability

- Sustainability addressed (Y/N)
- Follow-up period
- Factors supporting sustained implementation

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

26 Two reviewers will independently extract 20% of studies; single reviewers will extract the remaining with 10% quality checks.

## Stage 5: Collate, summarize, and report the results

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

28 Conduct narrative synthesis organized by:

(a) Implementation frameworks used and their utility
(b) Implementation strategies mapped to innovation types and phases
(c) Implementation outcomes by intervention type
(d) Fidelity/adaptation approaches and frameworks
(e) Barriers and facilitators by CFIR domains.

29 Create implementation strategy matrix cross-tabulating Powell strategies by innovation type and implementation phase.

30 Develop visual frameworks mapping implementation processes and pathways.

31 Identify knowledge gaps: underrepresented innovation types, underutilized frameworks/strategies, methodological limitations.

## Stage 6 (Optional): Conduct Stakeholder Consultation

32 Engage implementation science experts to review framework application and data extraction approach.

32.1 Consult with Dubai Health Flex Campus Network stakeholders to ensure relevance to distributed education contexts.

## Dissemination

33 Submit the final manuscript to a peer-reviewed journal specializing in implementation science or medical education (target: Implementation Science, Medical Education, Advances in Health Sciences Education, Academic Medicine).

34 Present key results at leading national and international conferences (AMEE, AAMC, ICRE, Implementation Science Conference).

35 Develop a practical toolkit for scaling educational innovations in distributed systems based on findings.

## Timeline

36
- Month 1: Protocol registration, search strategy validation, extraction form development
- Months 1-2: Database searches and citation management
- Months 3-4: Title/abstract screening
- Months 4-5: Full-text screening
- Months 6-9: Data extraction (Tier 1 and Tier 2)
- Month 8: Mid-extraction calibration meeting
- Month 10: Data synthesis and analysis
- Months 11-12: Manuscript preparation and submission

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## Acknowledgements

We wish to thank CORE/IoL for their support with logistics