Exploring Faculty Development Frameworks in Medical Education: Challenges and Opportunities

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This review examines the intersection of faculty development frameworks in medical education and instructional system design (ISD) principles. A systematic review of existing literature follows the PRISMA guidelines, and data analysis combined inductive and deductive approaches to examine key framework components, strategies in faculty development frameworks, and alignment with instructional system design principles. The findings show a tapestry of shared components and diverse approaches, each offering unique value. Incorporating ISD principles can amplify the impact of medical faculty development programs. The study can deepen our understanding of medical faculty development frameworks and provide valuable insights for creating reliable solutions.

Background

Faculty development (FD) is crucial in medical education as it helps educators in various aspects of their teaching, research, and professional journey (Hibbert & Semler, 2016). Faculty members benefit from FD programs which aim to enhance the quality of teaching, increase research productivity, and promote professional advancement growth (Johnson et al., 2023; O'Sullivan & Irby, 2011; Phuong et al., 2020;). In order for faculty members to succeed in their roles as educators, researchers, and professionals, it is crucial that they have current knowledge, skills, and abilities (Charlier & Lambert, 2020; Esterhazy et al., 2021). Well-structured FD programs enable faculty members to adapt swiftly to the rapidly evolving healthcare landscape and stay up-to-date with evidence-based practice (Hitchcock et al., 1992).

Instructional system design (ISD) is a systematic approach which guides the structured process of creating effective instructional solutions (Reigeluth, 1983). ISD applies learning theory and principles to ensure evidence-based instructional programs and interventions (Cook & Steinert, 2013; McGriff, 2001). The ADDIE model is a widely recognized ISD framework, comprising five stages: Analysis, Design, Development, Implementation, and Evaluation. The comprehensive approach ensures instructional solutions are pedagogically sound and adaptable to needs and learning outcomes of learners (Branch, 2009). Medical education institutions can better equip faculty with practical strategies for teaching, research, and professional growth using ISD principles.

Several FD frameworks have been proposed in medical education (Alhassan et al., 2022; McLean et al., 2008; Sullivan et al., 2011). In addition, review studies have been conducted to determine what specific content and elements (Fallis et al., 2022; Sirianni et al., 2020) and key features- such as content relevance, reflection with feedback, community building, and longitudinal intervention (Steinhart et al., 2012, 2016)- should be included in competency-based FD. However, further work is needed on how such content and features should be designed, developed, and delivered effectively.

Purpose of the Study

The study aimed to systematically review existing literature to guide an in-depth examination of the connections between existing FD frameworks in medical education and ISD principles. The findings shed light on implications and recommendations for enhancing medical FD programs. The research questions are threefold:

1. What are the essential components of the faculty development framework in medical education?
2. How do these frameworks guide faculty development program development?
3. How do these frameworks align with ADDIE principles of instructional system design?

Method

Search Database and Strategy

The systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). The literature search was conducted using electronic databases (i.e., Google Scholar, Eric, Web of Science, PsycINFO, JSTOR, PubMed, BEME, OpenMD) and other methods (e.g., reference and website search). The search terms included ["faculty development framework" and "medical education"] or ["teaching," "research," or "professional"]. In the search process, two authors refined criteria, conducted abstract and full-text reviews, and extracted data.

Selection Criteria

Inclusion criteria for the study were empirical studies published in peer-reviewed journals between 2000 and 2022 which examine FD frameworks in improving teaching quality, research productivity, and professional development in medical education. Exclusion criteria were studies which needed to provide more information on the FD framework or report its foundational principles.

Data Extraction and Quality Assessment

Data were extracted from the selected studies using a data extraction form. Out of a total of 481, 13 articles were included in the analysis. The extracted data included the author(s), year of publication, foundational theory, academic discipline, associated domain, specific element, and unique values. The quality of the selected studies was assessed using the predefined inter-rating selection bias tool (Whiting et al., 2016).

Data Analysis and Procedure

Next, a content analysis was conducted using a codebook to identify critical components, strategies, and alignments related to FD frameworks in medical education (Krippendorff, 2018). After reviewing the criteria to improve the accuracy, a member check was applied. The coding process involved an inductive approach to identify emergent themes and patterns for RQ#1 and 2, and a deductive approach to examine alignments with ISD principles for RQ#3. The intercoder reliability was calculated to ensure coding accuracy and agreement. (k=.79-1.0).

Results

The selected studies encompassed various frameworks, principles, and concepts to enhance faculty development in medical education. A total of five countries were represented by the 13 studies included in this review. The references marked with an asterisk are included in the meta-analysis. North America was the continent with the highest percentage of studies (USA: 5, Canada: 5), and others include Australia (1), Africa (1), and Asia (1). Of the studies included in this review, eight proposed a conceptual framework, and five explained foundational principles for medical FD development.

Components of FD Frameworks

Some key components included specific learning theories, foundational content, and faculty/institutional needs. The common components included: (a) delivering relevant content, (b) providing effective feedback, (c) employing longitudinal approaches, (d) establishing a shared vision, (e) institutional support, and (f) evaluating effectiveness. Overall, medical FD frameworks are multifaceted and can be improved heuristically with the use of these key components.

Approaches within Frameworks

The approaches used within the FD frameworks to guide program development are varied. Findings show sequential, comprehensive, and mixed approaches are constructed to engage faculty in development efforts. Additional emphasis is on the importance of iterative and interactive processes, longitudinal and parallel approaches, and the application of new lenses to enhance faculty development. These approaches collectively highlight the significance of a multi-dimensional approach to improving the FD processes and outcomes.

Alignments with ADDIE

The frameworks were examined using the ISD lens using the ADDIE model for effective FD programs and interventions. The included studies indicated different combinations of phases within the ADDIE principles. Most frameworks prioritized specific phases or their combinations, while some focus on the entire ADDIE process. This variability highlights the lack of an ISD model in tailoring faculty development to meet specific needs and contexts in medical education.

Discussion and Implications

The study revealed that FD frameworks in medical education share core components and approaches, though it is evident that no single, universal approach exists. These shared components and approaches collectively contribute to a well-rounded approach to FD, with each framework offering unique values. However, most frameworks do not highlight the importance of systematic approaches in designing, developing, and delivering solutions. Notably, the focus on FD underlines the commitment to connecting FD with the overarching goals of institutions or enhancing faculty's teaching and professional development. Research-related components are included only in two frameworks. FD often concentrates on individual participants; however, a broader perspective can enrich FD by integrating community building and workplace learning.

Tailoring FD programs to meet the specific needs and contexts of faculty and institutions is a challenge. One of the reasons for this challenge may be the lack of ISD integration. The frameworks include the different combinations of the ADDIE phases. Some frameworks prioritize the analysis phase through a

needs assessment and program outcomes. Others emphasize the development and implementation phases to provide FD solutions in a timely manner, and the evaluation phase to ensure that the FD resources remain aligned with changing needs and contexts. The other comprehensive approaches encompass all the phases, with iterative and interactive processes.

The challenge lies in determining which combination of the ADDIE principles best aligns with an institution's unique requirements, resources, and goals of its PD programs. By incorporating the ISD standpoint, medical FD programs can be more effectively tailored to address the specific needs and contexts of different institutions, departments, and individuals. By embracing ISD's agile and flexible principles, medical FD can be finely tuned to cater to the specific needs and contexts of diverse medical settings.

The study has some limitations. Our search for relevant studies may not fully represent the entire literature on the topic. Subsequent steps should involve validation through conducting an expert survey and field interviews and the formulation of evidence-informed guidelines for FD development.

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