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Faculty development program evaluation: a need to embrace complexity

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Abstract: Faculty development is essential for renewing and assisting faculty to maintain teaching effectiveness and adapt to innovations in Health Professions educational institutions. The evaluation of faculty development programs appears to be a significant step in maintaining its relevance and efficiency. Yet, little has been published on the specific case of faculty development program evaluation in spite of the availability of general program evaluation models. These models do not measure or capture the information educators want to know about outcomes and impacts of faculty development. We posit that two reasons account for this. The first is the evolving nature of faculty development programs as they adapt to current reforms and innovations. The second involves the limitations imposed by program evaluation models that fail to take into account the multiple and unpredictable outcomes and impacts of faculty development. It is generally accepted that the outcomes and impacts are situated at various levels, ranging from the individual to the institutional and cultural levels. This calls for evaluation models that better capture the complexity of the impacts of faculty development, in particular the reciprocal relationships between program components and outcomes. We suggest conceptual avenues, based on Structuration Theory, that could lead to identifying the multilevel impacts of faculty development.

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Keywords: Structuration theory, complexity theory, identity development, organizational norms, interpersonal relationships, program assessment

Background

There is increasing pressure for the professionalization of teaching practice in medical education.¹ It is widely recognized that teaching is a skilled profession that calls for multifaceted faculty development (FD) programs.²⁻⁶ As Steinert and Mann defined it, FD encompasses a broad range of topics and learning activities aimed to support faculty members in the enactment of multiple academic roles.³ Indeed, many FD programs offer training, not only to foster teaching and supervising skill development, but also to meet new requirements affecting medical practice and clinical roles.

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The implementation of competency-based medical education (CBME) has recently contributed further to rethinking FD programs to prepare teachers to play new roles and teach multiple competencies,⁷⁻¹¹ Given the complex nature of competencies¹² and the introduction of multiple competencies such as the CanMEDs in Canada¹⁰ or the Accreditation Council of Graduate Medical Education–Milestones¹³ in the United States, descriptions of teacher roles have become more diversified, as described by Harden & Crosby's 12 roles.⁷

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In this context, recommendations and principles of good practice for FD that have emerged highlight the need for a broader and more lasting impact for FD programs.^{3,5,14} This implies that FD programs need to be longitudinal in nature and expose participants to a broader range of teaching methodologies and be subject to continuous quality improvement.¹⁵ In this sense, FD has become part of continuous professional development for clinical teachers.¹⁶ Many faculties of medicine, in accordance to the guidelines of good practice, have implemented FD programs.^{14,17,18}

However, in spite of investing considerable resources, little is known about FDs effective impact on clinical teaching in particular and on broader change in the learning environment in general. Further, Haji et al¹⁹ found that when program evaluation is carried out, few of the expected outcomes are easily identified. Indeed, training program development teams focus mostly on curriculum and implementation and often neglect evaluation.²⁰ It is furthermore hard to explain the lack of program evaluation on the absence of models and frameworks to carry them out, especially in the educational domain.²¹ Frye et al²² define program evaluation as the

systematic collection and analysis of information related to the design, implementation, and outcomes of a program for the purpose of monitoring and improving the quality and effectiveness of the program.

A recent study identified five key papers about program evaluation that capture the attention of health sciences educators as revealed on a social media poll.²³ The papers focus on the methodology of evaluation, the context of evaluation practice and the challenge of modifying existing programs on the basis of evaluation results.²⁴⁻²⁶ They highlight the importance of gaining a holistic view of a program to better clarify the relationship between interventions and multiple outcomes as well as broader impacts.^{19,22}

Leslie, Baker, Evan-Lee, Esdaile & Reeves²⁷ recently provided a detailed account of the nature and scope of FD programs in medical education and aimed to assess their quality. Their review of FD programs reveals that self-reported changes in behavior is the most commonly reported outcome as well as an overreliance on quantitative surveys to collect data. The authors suggest that more rigorous evaluation methods should be used and that practice in the workplace as well as the effects of multiple organizational and contextual factors that shape the success of FD programs should be considered as well. In summary, the literature

suggests that only evaluating expected outcomes of a training program is not enough, broader impacts need to be taken into account.

It is clear that evaluation of educational programs requires a very different skillset than that normally possessed by teachers.²⁵ It requires a considered look at multiple variables that may have an impact on the outcomes of a given educational program. Swanwick²⁸ described FD as

an institution-wide pursuit with the intent of professionalizing the educational activities of teachers, enhancing educational infrastructure, and building educational capacity for the future. (p. 339)

It follows that the evaluation of FD impacts requires some thoughtful attention.

In this perspective paper, we aim to provide an overview of the existing models of educational program evaluation in order to suggest a conceptual framework for the specific case of evaluating FD programs. This framework was developed through an iterative process between the authors²⁹ in which we discussed and contrasted evaluation frameworks that have been proposed in medical education (eg,^{16,2,19,20,22,25,30,31}) and in education (eg,³²⁻³⁴). By doing so, we sought to identify potential avenues for evaluating the impact of faculty development programs.

Theoretical underpinnings

Theories of evaluation rest on the measures that are selected and the strategies applied to carry out program evaluation. Frye et al²² present an overview of the theories that underpin program evaluation models, suggesting three approaches: linear, systematic and complex.

The linear approach

The linear approach implies that the outcome of a training program can be predicted by observing the cumulative contributions of its constituent parts. This approach rests on the assumption of linearity and unidirectionality in the relationships between program components. That is, changes in one program component are expected to have a predictable impact on another component. Some program evaluation models such as the decision-based evaluation model developed by Kraiger,³⁴ clearly assume linearity. The model is composed of three components arranged in a linear relationship: 1) content and design of training, 2) changes within the learner and 3) organizational payoffs. The same can be said of the Kirkpatrick model,³⁵ where satisfaction, learning outcomes and behavior are assumed to be linked. Indeed, much

130 of the criticism leveled against current evaluation frame-
works in medical education points to their focus on obser-
vable outcomes, with little or no consideration of hard to
observe individual's perceptions and motivations and of the
environment where new learning will be used.

135 The systems theory approach

This approach posits that a system is composed of various
parts, the coordination of those parts and the relationships
among the parts. The system is also embedded within an
environment that has different impacts on its various parts
140 and all relationships are not static but constantly changing.
Hence, an educational program is a social system com-
posed of various parts that interact with each other and
with the environment in which it is embedded. For exam-
ple, the Context, Input, Process and Product evaluation
145 model takes into account the multiple relationships
among system components.^{21,33}

Context, in this model, plays a critical role in shaping the
approach to evaluating program effectiveness due to its
influence on program processes seen as separate and given
150 equal importance.³⁶ Parker and colleagues³⁰ developed an
evaluation logic model that sought to determine whether
the training program affects learners in anticipated and unan-
ticipated ways and how these results might help improve the
original program. The model maps the program components,
155 including inputs, outputs and anticipated outcomes, in order
to define the type of data - both qualitative and quantitative -
needed to measure processes and outcomes. This approach
takes into account multiple variables that will have an effect
on outcome and a wider impact on the field of activity. The
160 issue addressed by these authors is to provide a broader
framework than simply identifying what needs to be
measured.

Hence, system theory embraces the idea that change is an
inherent part of a system and is seen as a positive develop-
165 ment in evaluation theory since it focuses on individuals'
interactions with internal and external factors. However, it is
still very much based on linearity and has little affordance for
recursive or reciprocal interactions between variables.

The complexity theory approach

170 Medical education programs are best characterized as
complex systems; given that they are made up of diverse
components that interact reciprocally among each other.
Because of this, examining each of the interactions
between components in isolation fails to take into account

the overall impact of all relationships, and thus the system
as a whole.³⁷

Complexity theory allows for the uncertainty of educa-
tional program outcomes and would thus be appropriate to
evaluate its intended and unintended impacts by providing
useful data that serves program needs more effectively. In
180 other words, examining a program's success through com-
plexity theory leads educators to consider the interaction of
its components (eg, course design, participants, instructors,
etc.) with outcomes but also among each other as well as
with the environment. This, argues complexity theory, leads
185 to a greater appraisal of program's impact.

Haji, Morin & Parker¹⁹ present essential elements of
educational programs that should be taken into account in
an effort to develop a holistic program evaluation aimed to
identify if the predicted changes occurred and whether unpre-
190 dicted changes took place.

Durning, Hemmer & Pangaro²⁰ advocate for a three-
phase framework for program evaluation. This framework
allows for establishing relationships among baseline, process
and product measurements - Before, During and After -
195 aimed at collecting data, both quantitative and qualitative
from multiple stakeholders, that describe program "success."
In this case, program "success" is demonstrated when mea-
surements relate "inputs" to "outputs" and can be used to
understand the causes and shed some light into *how* the
200 program worked. Baseline measurements collect information
about trainees before entry into the program. Process mea-
surements capture the activities of learners and faculty as
well as how the program unfolded. Outcome measures cap-
ture the differences observed from baseline measures. 205

The above models capture complexity by multiplying
measurements, by mapping a logic model to identify rele-
vant data sources and by making affordances for unex-
pected outcomes. However, they do not provide viable
means to capture broader impacts that a training program
210 might generate in the workplace, on educational infrastruc-
tures and teaching culture. Yet, in the tradition of "realist
evaluation,"³² program evaluation should work to test
hypotheses about how, and for whom, programs are pre-
dicted to "work". This means collecting data, not just about
215 program impacts, or the processes of program implementa-
tion, but about the specific contextual and cultural contexts
that might impact program outcomes, and about the specific
mechanisms that might be creating change. We turn our
attention in the following section on the complex nature of
220 FD as has evolved and how it fosters change not only on
teaching practice but on organizational development.

The evolution of faculty development in medical education

225 In this section, we discuss characteristics of faculty development in medical education that promote change in order to argue for a broader approach to program evaluation. According to Fullan,³⁸ any FD program should endeavor to initiate and sustain change within the institution. It follows that effective program evaluation should focus on change: Is change occurring? What is the nature of the change? Is the change deemed “successful”? Kumar and Greenhill³⁹ identified the factors within an academic health care institution that shape how clinical teachers use educational knowledge acquired through FD. They draw attention to a combination of contextual, personal and interactional factors.

230 Yelon, Ford et al³¹ suggest that enactment of change hinges on three factors: First, the ability to enact change must be fostered by the FD program itself by providing adequate cognitive support for competency development.^{40,41} Second, FD participants have to be willing to apply their new learning in their workplace as Kogan⁴² suggests: change can be successful only when individuals commit to enact change in their own practice and to sharing their insights with colleagues. This depends on how they view the relevance and benefit of what they have learned.^{43,44} Third, workplace environments have to facilitate the application of the new learning by recognizing and overtly supporting the changes enacted by individuals.^{45,46}

240 All these factors include an individual dimension as well as a systems dimension,⁴² hence, in order to construct our argument about the complex nature of FD, we describe factors for change at an individual level followed by factors at a systems level.

255 Faculty development as a factor for change at an individual level

An important factor at play with regards to FD generated change at an individual level is related to identity development. Clinical teachers have a dual identity: to provide patient care and to teach.⁴⁷⁻⁵⁰

260 Attaining an appropriate balance between these asymmetrical identities is a challenge: physicians' comfort zone and greater medical expertise tilt the balance heavily in favor of the clinician. However, because FD aims to professionalize teaching practice rather than rely, as it often occurs, on intuition and past experience as learners,^{6,51,52} it necessarily entails a process of identity development.⁵³

Cruess, Cruess, Boudreau & Steinert name the process whereby a person learns to function within a particular society or group by internalizing its values and norms, as “socialization.”⁵⁴ This process is the driving force underwriting professional identity development in clinical teachers. Through complex networks of interactions, exposure to confirmatory role models and mentors, through experiential learning and explicit and tacit knowledge acquisition, medical students gradually start behaving like physicians.

Jarvis-Selinger, Pratt & Regehr describe the process of identity formation as

an adaptive developmental process that happens simultaneously at two levels:⁵⁵ (1) at the level of the individual, which involves the psychological development of the person and (2) at the collective level, which involves the socialization of the person into appropriate roles and forms of participation in the community's work.

It is important to distinguish socialization from training. Hafferty describes them as parallel processes; training involves the acquisition of knowledge and skills whereas socialization is seen as the effects of these acquisitions on the sense of self.⁵⁶

Furthermore, as recently indicated by Cruess, Cruess, Boudreau & Steinert⁵⁴ professional identity is in constant evolution, and given the current pressures on health care delivery systems, it is undergoing important transformations.⁵⁷ Hence, the literature clearly emphasizes that professional identity development occurs at multiple levels, from the individual and their personality, to the relationships with peers and others in their workplace and the broader context of the workplace.⁵⁸⁻⁶⁰

In addition to providing supervision, clinical teachers are required to model respectful, empathic and professional interactions with patients, their families and other professionals.⁴¹ This tends to take place in fast-paced and unpredictable settings, which continually challenge health care team members to choose between competing demands.⁶¹

Furthermore, clinical teachers often have little awareness of their specific training needs with regards to teaching, so that FD may be seen as an extra irritant. Given the above, there is little doubt that teaching in a clinical setting can be a demanding, complex and potentially frustrating task.⁶¹

This reality places clear limits for clinical teachers in terms of availability to participate in FD.²⁶ Settings where clinical teaching occurs are facing the need to adapt themselves to this reality, which leads to innovative ways to carry

315 out FD. We have seen that a strategy whereby clinical teachers are trained in their workplace and offered peer support has yielded encouraging results.^{62,63} In the co-teaching model,⁶⁴ paired physicians focus on developing their teaching skills while sharing the clinical supervision of trainees. Through teaching, debriefing and planning, co-teachers gain 320 experience in analyzing teaching encounters and develop skills in self-evaluation. At the core of these approaches is the sharing of insights and co-development of teaching practice which occurs at a system level.

325 Given these developments, it is not surprising that FD itself is called upon to evolve. New strategies and methods are being implemented, and the content material is expanding continuously encompassing such topics as leadership and organizational change as well as specific competencies.^{15,65}

330 Faculty development as a factor for change at a systems level

Because clinical teachers usually teach in multiple settings, be they inpatient, outpatient and community clinics, each with their own distinct culture and traditions,^{48,61} transfer of new learning from FD programs depends on multiple factors that 335 extend beyond an individual's newly acquired skills.

The behaviors and practices within social entities such as clinics and hospitals are often grounded in traditions that form, what Bourdieu⁶⁶ describes as *doxa* (ie, implicit, unchallenged assumptions). This in turn produces *habitas* – 340 the habitual, patterned and thus pre-reflexive way of understanding and behaving that helps generate and regulate the practices that make up the social fabric of a faculty of medicine and its teaching hospitals.⁶⁷ The introduction of patient partnerships for health care delivery improvement^{68–70} and interprofessional collaboration^{71–74} 345 are examples of changes that challenge the long-held *habitas* in medical training institutions.

Although FD activities tend to focus predominantly on teaching and instructional effectiveness, the systems level 350 perspective points to a critical need to expand FD curricula in order to reinforce teachers' capacity to become organizational change agents.⁷⁵ This implies that clinical teachers are expected to play increasingly complex roles that go beyond simply doing rounds with students. They 355 also imply that clinical teachers are often called upon to model what they are themselves learning.^{1,7,76–78}

From the above points, it becomes clear that as medical education evolves, so too does FD. Its impacts must be recognized and evaluated at multiple levels; on organizations, on

professional identity development, on workplace norms and 360 culture, on clinical teaching roles. These characteristics make FD a special case within the domain of program evaluation rendering traditional methods of evaluating a training program insufficient to capture the complexity of its impacts.

In essence, the approach to program evaluation should 365 take into account what is known about faculty's perspectives on education, competency development, theoretical knowledge about learning, as well as their personal characteristics, including teacher identity. The approach should also take into account multiple contextual factors such as 370 time allotment and protection for teaching, academic promotion rules that favor or hinder importance of teaching and the actual setting where the teaching is to take place including logistical issues. Finally, bodies that regulate practice for all health professions also have an impact on 375 teaching practices and consequently on FD.

Discussion

Cognizant of Steinert's work on FD as a longitudinal endeavor that enacts cultural change, it became clear to us that the linear and systemic approach, as discussed earlier, insufficiently 380 captures the complexity of the outcomes and impact of FD. Furthermore, FD programs occur within organizations in which individuals work together for varying periods of time, share responsibilities for the common goal of educating clinicians and work under common and evolving norms and 385 practices. Impacts are therefore recursive and are not bound to the logic of linearity.

We felt it appropriate to seek a more adaptive conceptual framework, and our aim here is to present its possible components. We turned to complexity theory to undertake the 390 shift from focusing on the individual parts of a system and their linear relationships with the outcomes and impacts.³⁷

Complexity theory points to the multiple and reciprocal relationships between the parts and the outcomes, which 395 implies that not only that the whole is more than the sum of its parts, but that the parts mutually impact each other as well as the outcomes. This appears suitable for faculty development programs where academic directors, teachers, students and patients will mutually influence each other generating multiple changes which will, ultimately, 400 shape the organizational culture within the institution.

In order to appropriately capture the psychological and social impacts of FD, Giddens' Structuration Theory, a sociological application of complexity theory, 405 allowed us to identify domains that adequately capture

change.⁷⁹ Structuration theory posits that actions undertaken by individuals within a community or organization contribute to the creation of social structures, norms, hierarchies, values, beliefs, etc., that in turn frame the way individuals act and relate to each other. Hence, structuration theory helps to situate faculty development within a dynamic process - structuration - that evolves in time.

We suggest that application of Structuration Theory to FD program evaluation rests on three processes: 1) the process of professional teacher identity development, 2) the process of how individuals shape organizational structures and 3) the interactions between the individuals themselves. As seen in Figure 1, FD programs can easily be situated at the junction of these three structuration processes.

Focusing FD program evaluation on the reciprocal impacts of the three processes – identity, norms and interactions – portrayed by the overlapping areas in Figure 1, offers comprehensive and dynamic insights into the evolution of teaching practices. These overlapping areas are strengthening of roles, creating new practice models and becoming agents for change.

Evaluate how FD impacts professional roles

As discussed earlier, clinical teachers are required to play multiple roles and thus a key objective of FD is training

towards these roles. A case in point are the roles in collaborative practice to which clinical teachers must be trained.

In a recent study on professional identity and collaborative practice conducted by Joynes,⁸⁰ FD emerges as an effective means to enhance interprofessional collaboration. Addressing the tension between students’ developing professional identities and the need to learn collaborative practice could be part of the FD curriculum. Most FD curricula include topics on collaboration (ie, how to make decisions in a simulated team, etc.) and how to supervise collaborative practice.

Many programs also include training activities where health professionals from multiple disciplines learn together. The underlying principle is that training together leads to better understanding of respective roles and supports successful enactment of these roles in collaborative practice. Thus, by strengthening each professional role and supporting collaborative practice, FD has a far-reaching and highly complex impact on how health professionals interact among each other while playing their roles.

It appears therefore crucial to capture the degree to which FD outcomes and impacts support multiple roles among health professionals. These impacts, as presented in Figure 1, are at the confluence of the evolution of professional identity and the evolution of interactional models.

Evaluate how FD generates new practice models

Physicians who are teachers work in academic health care institutions which are endowed with well-defined norms, regulations, codes of conduct, etc. Structuration Theory conceives of these norms as being part of a reciprocal relationship between individuals who work collectively and abide by them and their institution. It follows that interactional models, reflecting how individuals relate to each other, contribute to shaping the institutional norms and practices. We posit that the combined impacts are best observed by evaluating the new practice models that emerge at the confluence of the two processes.

The implementation of CBME serves as an illustration in that it challenges accepted norms and practices, sometimes contradicting long-held values in medical education, as well as impacting interactional models between peers and students.¹² For example, CBME FD programs introduce novel evaluation tools such as Entrustable Professional Activities (EPAs).⁸¹ These are collectively agreed evaluation tools that allow instructors to judge whether a professional activity can be “entrusted” to a trainee. Because EPAs are

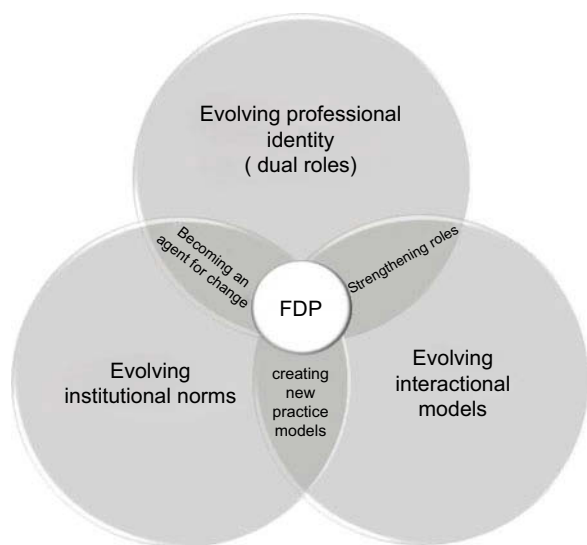


Figure 1 Faculty development program (FDP) evaluation: complexity of the outcomes and impacts.

480 agreed by faculty members, it calls upon meaningful inter-
actions among them. The fact that students have prior access
to the EPAs and thus know what is expected of them will also
shape their interactions with instructors. Hence, as CBME
challenges the institutional norms, the interactional models
485 between students and instructors are called upon to generate
new practice models. In our view, FD program evaluation
needs to capture this evolution faithfully.

Evaluate how FD participants become agents for change

490 Professional identity shapes the way individuals interact,
share knowledge and create new knowledge and hence has
impacts on the culture of a teaching institution as well as
its norms. This reciprocal relationship has complex rami-
fications that are hard to capture.

495 Yet, if we consider that FD fosters development of
multiple professional identities that will be adapting to
changing institutional norms and culture, their mutual
impact cannot be ignored. Learning is mediated by inter-
personal interactions, focusing on the critical nature of
mentor–mentee relationships for conveying commonly
500 held knowledge, as well as reinforcing and transmitting
the cultural norms of a given community. In the case of
medical education, the dual role of clinical teachers –
clinicians and teachers – subjected to competing demands
from the institution adds a further level of complexity.

505 Changes in an individual's teaching practice reflect evolu-
tion in their professional identity, which in turn leads to
challenges to institutional norms and teaching culture with
the corollary impacts on the workplace. Steinert⁷⁵ comment-
ing on the future of FD calls for medical educators to demon-
strate leadership and management skills, required to become
510 agents for change. These are the individuals who actively seek
to introduce innovations in the way work is carried out by
asking typical questions such as these: What is the value that
the organization assigns to teaching activities? What are
515 the competencies that the organization values? What are
the unsaid norms and regulations in a given setting that
shape teaching practice? In our view, a sound program evalua-
tion approach should encompass how agents for change shape
teaching culture within the teaching hospital and the medical
520 school and how they challenge institutional norms.

Conclusion

Given the complexity of medical education, we have pre-
sented a case to develop new approaches and methodologies

to evaluate FD programs with the view to yielding more
relevant information. 525

We consider this a critical evolution because of the
rapid nature of change within medical education, health
care delivery and clinical practice. As new norms and
practices evolve, FD program designers will need to lever-
age reliable information about the impacts of their work to
530 enhance FD programs.

Our aim was to argue that FD programs have multiple
outcomes and impacts that are multiplicative and recipro-
cal. In future work, through experimentation with these
concepts in real settings, practical methodologies and tools
535 can be designed that can ultimately benefit FD developers
and educators. Possible aspects that could be considered as
FD impacts are evolving teaching and learning styles,
students and resident well-being, patient outcomes, work-
place satisfaction, etc. 540

We sought to help medical educators answer the fol-
lowing question: What are the impacts of FD interventions
not only on the knowledge, attitudes and skills of clinical
teachers, but also on their dual professional identity devel-
opment, on their interactions with other professionals,
545 students and patients and, finally, on the institutions in
which they work collectively? According to Steinert,⁷⁵
FD can play a critical role in promoting cultural change
at a number of levels that, as we have seen, reciprocally
impact each other. We suggest that FD program evaluation
550 focuses on how professional roles evolve, on how new
practice models emerge and on how agents for change
challenge accepted norms and practices.

Disclosure

The authors report no conflicts of interest in this work. 555

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