

## TWO SIDES OF THE SAME COIN

1 **Title:** Two sides of the same coin? How quality improvement can be used to augment  
2 program evaluation in health professions education to promote social accountability

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4 **Short Title:** Two sides of the same coin

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24 **Data Availability:** Data sharing not applicable to this article as no datasets were generated  
25 or analysed during the current study.

26 **Abstract**

27 Health professions education is in constant pursuit of new ways of teaching and  
28 assessment in order to improve the training of healthcare professionals. Educators are  
29 often challenged with designing, implementing, and evaluating programs in the context of  
30 their professional practice, particularly those in response to dynamic and emerging social  
31 needs. This article explores the synergies and intersections of two approaches – quality  
32 improvement and program evaluation – and the potential utility of their combinations within  
33 our field to design, evaluate, and most importantly, improve educational programming. We  
34 argue that the inclusion of established quality improvement frameworks within program  
35 evaluation provides a proven mechanism for driving change, can optimize programming  
36 within the multi-contextual education systems, and, ultimately, that these two approaches  
37 are complementary to one another. These combinations hold great promise for optimizing  
38 programming in alignment with social missions, where it has been difficult for institutions  
39 worldwide to generate and capture evidence of social accountability.

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41 **Keywords:** program evaluation, quality improvement, social accountability

## 42 Introduction

43 Inextricably situated within broader sociopolitical contexts, medical schools are intimately  
44 impacted by the economic and cultural forces that operate throughout society while  
45 simultaneously possessing the power to influence these forces.<sup>1,2</sup> Indeed, the policies and  
46 practices of medical education directly influence how medical professionals provide patient  
47 care,<sup>3</sup> who gets to become a physician,<sup>4</sup> and how the population accesses healthcare.<sup>5</sup>  
48 Most medical schools acknowledge this power and articulate social accountability mission  
49 statements as an institutional commitment to societal needs.<sup>6-8</sup> The social mission of a  
50 medical school can translate to include a myriad of activities, including programs that aim  
51 to foster equitable access to medical training (e.g., admissions and selection initiatives)  
52 and that bring to the fore curricular strategies (e.g., service-learning, community  
53 placements, clinical encounters with vulnerable populations) designed to produce  
54 outcomes that are reflective of societal needs (e.g., graduating physicians who will practice  
55 in under-served areas).<sup>6-9</sup>

56

57 That these missions are discussed in terms of social *accountability*, and not just  
58 social *responsibility*, is important. It highlights that institutions must do more than simply  
59 implement programming that intends to improve on social outcomes; but that they must  
60 evaluate, interpret, and present evidence of the success of their efforts to those staked in  
61 the success of the missions.<sup>10</sup> In other words, institutions must take account. Yet there is  
62 minimal evidence to support the notion that social accountability mandates directly  
63 improve outcomes, despite the importance of medical schools doing so.<sup>8,11</sup>

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65 There are several possible reasons for this. As a starting point, accreditation  
66 standards typically focus on process than outcomes, meaning that schools do not

## TWO SIDES OF THE SAME COIN

endeavour to present outcomes.<sup>12</sup> Secondly, many of these social missions may not be particularly prioritized or sufficiently resourced compared to missions focused on profit-making and elevating perceptions of institutional prestige<sup>6,7,13</sup> or treated primarily as a bureaucratic activity designed to do little more than meet the minimum accreditation requirements.<sup>12,14,15</sup> That is to say, the programming cannot be shown to be successful because it is not. Thirdly, medical schools enact systematic program evaluations to generate evidence to stakeholders about whether a program is achieving desirable outcomes, why or why not, and what other unanticipated outcomes may be resulting.<sup>16–21</sup> While numerous medical schools are committed to their social missions, many of these institutions struggle to produce effective programs. In these cases, we offer that much of these shortcomings may emanate because contemporary approaches to program evaluation are not sufficiently adaptive. There are a plethora of modern evaluation approaches used in medical education contexts, each with its own emphasis on program implementation, operation, and affordance for complexity, and the stated objectives of producing evidence about how well a program functioned within its context and identifying areas that may benefit from improvement (see Frye & Hemmer, 2012 for a comprehensive overview of program evaluation models in medical education).<sup>19,22–26</sup>

It is with respect to this second objective (i.e., to identify areas for improvement) that we consider how contemporary program evaluations in medical education may be falling short. That is, we notice most current program evaluations exclude a mechanism to foster real-time improvement efforts. Essentially, an assessment of the merit for a program is made at the end of the evaluation with no subsequent activity, beyond speculation, directed to leveraging the knowledge gained towards end-of-evaluation enhancements to the program itself. In the context of dynamic social priorities, this means that medical schools may be measuring the effectiveness of their social accountability efforts with tools

that do not afford them the ability to be responsive to signals for improvement in a timely manner. With this in mind, we present here an exploration of how the integration of an existing and well-established methodology for rapid and responsive change may be used to optimize the program evaluations commonly conducted in medical education contexts - quality improvement (often referred to as 'QI'). Our goal is to show how quality improvement – which is already valued in the healthcare system – may be effectively applied in medical education to drive improvements to outcomes that provide evidence of social accountability. In doing so, we provide a broad overview of quality improvement as an approach for performance improvement. We describe the practical integration of a commonly used quality improvement model with program evaluation, exploring how quality improvement might augment the evaluation. Finally, we discuss the advantages of embedding quality improvement within the program evaluation toolbox<sup>27,28</sup> and the potential benefits it may have in promoting social accountability.

### What is quality improvement?

Quality improvement is an umbrella term that refers to systematic approaches to better the performance of a system by improving its structure, processes, and outcomes at a local level.<sup>29,30</sup> While it is commonly conflated with “continuous quality improvement” – an overarching philosophy that reflects the persistent focus on optimizing performance within a system – quality improvement refers to the specific frameworks that have been established and the methods and tools that are deliberately applied to generate improvements.

The foundational principles of contemporary quality improvement frameworks were developed out of the manufacturing industries in the early 1900s.<sup>31,32</sup> Although often used

synonymously with other performance management approaches such as quality assurance and quality control, the primary focus of quality improvement is on driving and sustaining internally-driven, deliberate, and iterative improvements to enhance local performance to a level not previously achieved. In healthcare, quality improvement methods are used widely to reduce error, mitigate harm, enhance patient safety, and improve healthcare outcomes.<sup>33</sup> Health professions education has recognized the clinical utility of quality improvement through its integration within competency frameworks, requiring formal training in this area as part of the core curriculum and suggesting that all graduating healthcare professionals should be competent to contribute to health systems improvement efforts.<sup>34,35</sup>

There are several frameworks for quality improvement that differ in procedural techniques and their focus for improvement but share common features. They all focus on improving system performance at the local level and collect data continuously to conscientiously drive changes. Each framework typically involves two main components: an executive function of defining the goals and the relevant performance indicators that are the focus for improvement, and a set of tools that are applied to achieve these goals. Changes are typically implemented incrementally, tested iteratively, and monitored continuously with the goal of ensuring that changes introduced into the system adapt to the local context so that improvements can be sustained.<sup>29,36</sup> One prominent example, which we will use as an illustration throughout this paper, is the Model for Improvement.<sup>37</sup> This is a useful framework for implementing changes in a cyclical and iterative manner frequently used in healthcare and is commonly taught to medical learners as part of quality improvement curricula.<sup>38</sup> The Model for Improvement defines an aim at the outset, a “family of measures” spanning three categories of indicators - outcome, process, and balancing measures.<sup>39-41</sup> This is followed by the iterative application of Plan-Do-Study-Act

## TWO SIDES OF THE SAME COIN

(PDSA) cycles to test, optimize, and sustain an intervention or change concept<sup>42</sup>. PDSA cycles allow for new concepts to be introduced in less threatening ways, adapt and tailor new interventions to new and unfamiliar contexts, and ultimately, improve the likelihood that a change will lead to an improvement.<sup>43</sup>

An important shared feature of all improvement frameworks is that they emphasize context.<sup>44</sup> While it is a necessity to consider a diversity of contexts when establishing research evidence that is generalizable, the specific contextual factors in any one environment may not always be visible and can unintentionally disrupt the stability and viability of an applied intervention that was developed elsewhere.<sup>44,45</sup> Quality improvement, thus, treats context as an intrinsic part of the system that shapes the implementation, uptake, sustainability, and outcomes of an intervention.<sup>46</sup> This focus positions quality improvement to give way to tailored interventions that are adaptive to the way they are situated locally. Accordingly, quality improvement may be particularly beneficial when medical education programs are implementing existing interventions developed at other schools. By refining the intervention to the local context, it can be optimized for success.<sup>47,48</sup>

Despite many similarities, quality improvement is categorically different from program evaluation (Table 1). Where evaluations aim to provide evidence about the merit and worth of a program to stakeholders, quality improvement aims to generate and sustain improvements in a system at the local level.<sup>49,50</sup> This is an essential distinction that impacts perspectives on how data are collected and what type of knowledge is sought. For instance, program evaluations may isolate contextual variables with the goal of reporting about program effectiveness with these variables factored out, where quality improvement efforts will recognize that these variables are intrinsic to the system and play a role in the

uptake and eventual impact of an intervention. Thus, they must be embraced as part of improvement efforts in order to implement and sustain changes in any environment.

[Insert Table 1 here]

## Using quality improvement to augment program evaluation

While quality improvement has been successful in driving performance improvements in healthcare, it has yet to be legitimized as a tool that can promote excellence and innovation in medical education.<sup>35,51</sup> In this regard, we believe that program evaluation and quality improvement have a complementary nature; and can augment one another to enhance the medical school's ability to adapt programs in real-time and, ultimately, achieve better outcomes (Figure 1). In the following sections we outline three dispositions of quality improvement activity relative to program evaluation: in advance, following, and concurrent.

[Insert Figure 1 here]

### Pre-evaluation quality improvement

To begin, quality improvement can be beneficial as a pre-cursor to program evaluation to inform the initial design and implementation of a local intervention that would later be more robustly evaluated. In this sense, the quality improvement approach would help establish a “*proof of concept*” for the subsequent intervention.<sup>52</sup> While innovation is naturally desirable, introducing novel interventions to unfamiliar contexts within complex systems is challenging, and if not carefully planned, can result in failed implementation. Medical



schools that implement new curricula often experience a “performance dip” - a period where performance declines following curricular change or modification.<sup>53</sup> A primary advantage of using quality improvement methods at an early stage is to tailor an intervention to the local context and increase the likelihood of its sustainability and long-term success. For example, a one-to-one pilot can be used early on to test and refine an intervention with one person (or one pilot group) before expanding to a larger number of users in the subsequent iterations. The use of multiple iterative tests allows for issues surrounding the fidelity of an intervention to be identified and addressed early on in order to optimize the adaptation of the intervention to a new and unfamiliar context and increase its uptake and functionality as it expands beyond the pilot cycles in that local context. Once an intervention has undergone multiple cycles to adapt to the local context, post-implementation program evaluations can be used to generate a comprehensive understanding of how and why the intervention worked.

One example of this in the health professions literature reports using the Model for Improvement to guide the design, implementation, and refinement of an educational intervention aimed at providing pre-clerkship medical students with interprofessional, experiential learning before conducting a broader program evaluation once the initiative was further scaled.<sup>54,55</sup> PDSA cycles were beneficial in identifying and refining the intervention (a structured shadowing shift with a nurse) by testing out different clinical settings (e.g., different medical inpatient units), periods for optimal experiential learning (e.g., days of the week, timing and duration of shifts), scheduling tools for scheduling students, and methods for preparing learners for their interprofessional experience (e.g., learning objectives, FAQ, example questions to ask the nursing preceptor).<sup>56</sup> Subsequent PDSA cycles facilitated the spread of the initiative to include additional members of the

## TWO SIDES OF THE SAME COIN

219 interprofessional team (e.g., speech-language pathologists) and to another distributed  
220 campus of the medical school.

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### 222 Post-evaluation quality improvement

223 In addition to being organized as a precursor for program evaluation, quality improvement  
224 approaches can also serve as a mechanism for post-evaluation improvements to further  
225 refine the program itself. Program evaluations determine whether intended objectives were  
226 met and demonstrate value to relevant stakeholders; however, they also highlight areas of  
227 a program that may not be working as well as it could. Based on the evaluation findings,  
228 educators may wish to refine the program further to improve the fidelity of the program  
229 itself, the primary outcomes of the program, or address any potential unanticipated  
230 outcomes identified using evaluation models that examine complexity or emergence.<sup>57</sup> For  
231 instance, realist evaluations explicitly focus on understanding how context and  
232 mechanisms can influence outcomes, generating explanatory knowledge that informs  
233 future refinements to the program.<sup>19</sup> Here, quality improvement methods can be used to  
234 follow up on these findings to manipulate contexts and mechanisms that have been  
235 identified to influence outcomes. These sequential applications may be particularly useful  
236 for new programs that did not use quality improvement as a pre-cursor to their evaluation,  
237 especially programs that are broadly implemented that do not initially work perfectly in  
238 practice. There is often a need to modify aspects of a program or process which did not  
239 lead to the intended outcomes, eliminate aspects that contributed to poor outcomes, or  
240 integrate additional components to the program to better achieve the desired outcomes.  
241 Each of these improvement areas can be targeted through the use of quality improvement  
242 tools and methods.

243

As a post-evaluation tool, quality improvement methods may be useful in augmenting the translation of institutional social missions into practice. Consider, for instance, Dharamsi and colleagues (2010) pilot test of a new, two-year community service-learning initiative with 8 elective student groups.<sup>58</sup> In this case, quality improvement methods could be used to expand the existing service-learning initiatives to provide students with opportunities to learn about new populations with acute or emergent health needs. Through iterative cycles, each expansion of the intervention could be tested and refined before its full integration into the core curriculum.

### Evaluation-embedded quality improvement

Finally, there may be value in concurrently integrating quality improvement methods within program evaluation models and activities. The concurrent use of quality improvement methods could involve the ongoing use of PDSA cycles throughout the program evaluation to iteratively refine the intervention to improve its fidelity, impact, and sustainability. This provides evaluators with a feedback mechanism to address areas for improvement in real-time rather than awaiting the results and interpretation of the program evaluation - often conducted long after the conclusion of the program. This alternation between quality improvement and program evaluation under the scope of a broader evaluation initiative can, theoretically, continue until the program is producing the best results it possibly can. This would efficiently optimize the intervention itself and the outcomes captured through the evaluation that would be presented to stakeholders.

Ultimately, the use of quality improvement methods in conjunction with program evaluations seems to be a natural fit: evaluations may be incomplete without improvements, and improvement activities such as quality improvement can benefit from

further evaluations. In this manner, quality improvement and program evaluation may be two sides of the same coin. Together, they can be used to promote real-world, sustained improvements at a local level and to produce knowledge that is generalizable beyond the local context.

## Discussion

The perception that accreditation has the potential to catalyze educational reform to promote social accountability is supported by minimal evidence.<sup>14,59</sup> On the other hand, there is considerable evidence that medical schools are making efforts to be socially responsible.<sup>6,8</sup> This evidence suggests that schools are moving forward with well-intended programs; yet focus almost exclusively on indexing the processes of implementation rather than impacts.<sup>15</sup> It is our position that some of this shortcoming emanates because program evaluation remains the central activity for appraisal. We offer here that the contemporaneous application of quality improvement methods could be used to drive improvements to programs while also offering a foundation for adapting programs in a way that moves them further along the “social obligation scale” from responsibility to accountability.<sup>10</sup>

Notably, the use of quality improvement methods within education program evaluations reflects an existing ideal for accreditation. The Liaison Committee on Medical Education requires that medical schools in the United States and Canada “*engage in ongoing planning and continuous quality improvement processes that establish short and long-term programmatic goals, result in the achievement of measurable outcomes that are used to improve programmatic quality, and ensure effective monitoring of the medical education program’s compliance with accreditation standards*” (Standard 1.1: Strategic

Planning and Continuous Quality Improvement).<sup>28</sup> This standard implies that medical schools should be using established improvement methods and techniques, yet the deliberate use of quality improvement methods has yet to become incorporated within accreditation.<sup>60–63</sup> However, the literature does maintain reports of three American medical schools that have applied quality improvement methods to drive enhancements to their undergraduate curriculum.<sup>64</sup> Given that accreditation requires educators to reflect on the quality of their programming and identify areas that warrant improvement – whether previously known or unknown – the uptake and integration of the established quality improvement approaches, tools, and methods hold great promise to enhance accreditation efforts and contemporary physician training.

The relationship between quality improvement and social accountability has received little attention in the medical education literature; and where it does, quality improvement is consistently conflated with notions of quality assurance and complying with minimum accreditation standards.<sup>65</sup> Boelen and Woollard (2011) have illuminated how quality improvement can promote social accountability, presenting a model for schools that involves an active feedback loop and allows for the continuous refinement of institutional missions and educational programming as social needs evolve.<sup>10</sup> More recently, Clithero and colleagues (2017) have also proposed a social accountability model that is cyclical, moving from implementation to evaluation, and requiring post-evaluation adjustments to the governance, education, research, and services of a medical school.<sup>66</sup> These models reflect the core principles of quality improvement; that the activity is iterative, attentive to local needs, and focused on moving beyond processes so as to improve and sustain outcomes.

While social missions are often designed around the priority health concerns and needs of under-served and vulnerable populations, these needs differ by social, geographic, and cultural contexts and across time.<sup>67,68</sup> New and acute priorities can emerge that may not directly align within the scope of an institution's defined social mission, but reflect inequities or disparities that warrant immediate inclusion in the activities of a medical school. Here, quality improvement methods are useful in innovating new initiatives or adapting existing interventions in response to emerging social needs. For instance, medical schools are currently responding to the public demand for organizations to address institutional racism,<sup>44,69,70</sup> and numerous medical schools have responded by publicly declaring their commitment to taking action, including increasing the representation of Black medical students and faculty. There is an opportunity here to adapt existing interventions, such as expanding current admission policies used to increase the inclusion of under-represented groups (i.e., those that facilitate access to medical school for Indigenous applicants), or to translate interventions that have been successful in other contexts (i.e., the Black Student Application Program at the University of Toronto).<sup>71</sup> In these instances, quality improvement methods should guide the initial implementation and iterative refinements to these policies such that the changes made ensure that they function optimally in the new context.

It has been suggested that educational evaluation "*drives the development and change of curriculum,*" and that "*evaluation is about helping medical educators improve education.*"<sup>72</sup> Curricular reform and innovation are indeed necessary in health professions education, yet exactly *how* schools improve remains ambiguous and is likely highly variable. While program evaluation is a central activity within medical education, the primary need to provide evidence of merit to stakeholders and the bureaucratic nature of some evaluation activities, such as accreditation, can detract from end-of-evaluation

improvements. The use of established improvement methods associated with quality improvement has yet to become standard practice in medical education on their own or in combination with evaluation efforts. This paper operationalizes quality improvement as a mechanism for improvement that can be used sequentially or concurrently with program evaluations to enhance the outcomes of social missions.

It is our position that quality improvement and program evaluation are complementary approaches. The integration of quality improvement provides evaluations with an established and efficient approach to driving improvements at the local level and further diversifies the program evaluation toolbox, providing methods and approaches that can drive small-scale improvements in the highly contextualized environments common to medical education. The deliberate use of quality improvement methods within evaluations can emphasize improvement-driven evaluation activities and, in the end, generate sustainable improvements in outcomes. This may be particularly beneficial in the area of social accountability, where evidence of outcomes and societal impact is critically lacking. Medical schools not only have an obligation to be responsive to unmet societal needs and improve the health status of society, they must also generate evidence that they are doing so. Quality improvement appears to be a natural fit with the current conceptualizations of social accountability as the proactive response to anticipated societal concerns and inequities through contextualized programming that graduates health system change agents and positively impacts health outcomes. The combination of quality improvement with program evaluation would ensure medical schools are responsive to emergent needs and transform the institutional social mission and educational practices so as to produce evidence to stakeholders of optimal training outcomes that can positively impact health outcomes.

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## TWO SIDES OF THE SAME COIN

567 Conflicts of Interest: The authors have no relevant financial or non-financial interests to  
568 disclose.

569 Funding: None.

570

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572 **Table 1: A Comparison of Program Evaluation and Quality Improvement**

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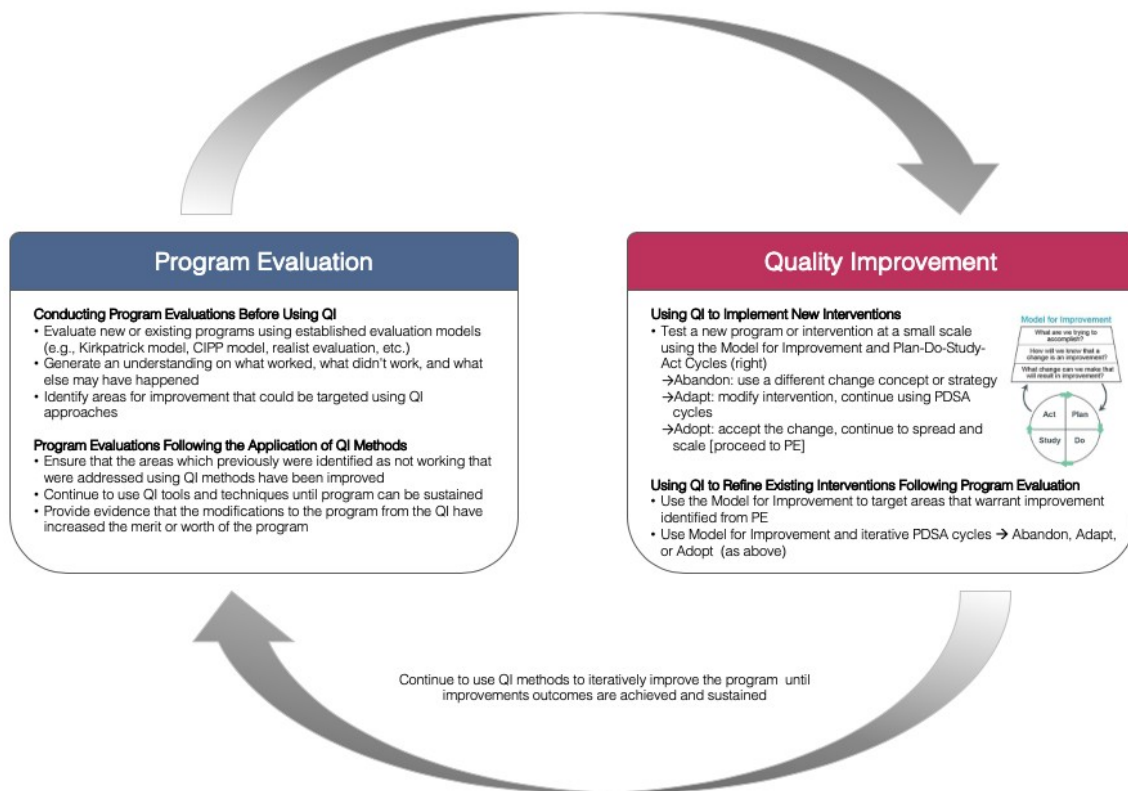
	Program Evaluation	Quality Improvement
Objective	· Understand how well a program is working in its given context	· Reach a new level of performance at a local level
Methods and Models	· Various evaluation models (e.g., CIPP, Logic Model, Kirkpatrick)	· Various QI models (e.g., The Model for Improvement, Lean, Six Sigma)
Common Output	· A comprehensive understanding of what worked, what didn't, and what else happened	· A sustained improvement to a system
Purpose of Knowledge	· Provide evidence of merit or worth to stakeholders	· Ensure a change has led to a sustainable improvement at a local level

574

575 *A high level summary of program evaluation and quality improvement to outline how these two*  
 576 *approaches can be distinguished from one another in their ideological and procedural features,*  
 577 *which may be complementary to one another if deliberately combined.*

578 **Figure 1. A framework for using quality improvement in conjunction with**  
 579 **program evaluation**

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