

# Flipping the classroom to teach Millennial residents medical leadership: a proof of concept

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**Introduction:** The ongoing changes in health care delivery have resulted in the reform of educational content and methods of training in postgraduate medical leadership education. Health care law and medical errors are domains in medical leadership where medical residents desire training. However, the potential value of the flipped classroom as a pedagogical tool for leadership training within postgraduate medical education has not been fully explored. Therefore, we designed a learning module for this purpose and made use of the flipped classroom model to deliver the training.

**Evidence:** The flipped classroom model reverses the order of learning: basic concepts are learned individually outside of class so that more time is spent applying knowledge to discussions and practical scenarios during class. Advantages include high levels of interaction, optimal utilization of student and expert time and direct application to the practice setting. Disadvantages include the need for high levels of self-motivation and time constraints within the clinical setting.

**Discussion:** Educational needs and expectations vary within various generations and call for novel teaching modalities. Hence, the choice of instructional methods should be driven not only by their intrinsic values but also by their alignment with the learners' preference. The flipped classroom model is an educational modality that resonates with Millennial students. It helps them to progress quickly beyond the mere understanding of theory to higher order cognitive skills such as evaluation and application of knowledge in practice. Hence, the successful application of this model would allow the translation of highly theoretical topics to the practice setting within postgraduate medical education.

**Keywords:** flipped classroom, leadership, medical education, postgraduate, millennial, residents

## Introduction

Health care delivery is transforming at a very fast pace, and along with this transformation are the changing expectations of health care consumers and the operational processes required to address them. The past decade has also witnessed a steady rise in the need for change in the preparation of (future) physicians' management and leadership competencies. However, leadership development can be viewed in different contexts and along different anticipated leadership skills. Unfortunately, the research strategies that are available to design and evaluate the impact of leadership development across clinically relevant outcomes are not straightforward. Furthermore, scholarship related to health care leadership development consists of a mixture of studies that remain difficult to interpret and apply in practice.<sup>1-3</sup> This awareness has led to noticeable and significant changes in the curricula of many postgraduate training programs. However, despite the implementation of several reforms in the medical curricula, a

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gap remains between the awareness of the need for leadership development and the implementation strategies to develop it in postgraduate training programs.<sup>4</sup>

Different health systems operate in multifaceted, intertwined and dynamic networks of systems,<sup>5</sup> which have resulted in complex processes of leadership. These are reflected by the combinations of different leadership styles, various coalitions of stakeholders with the same vision and the distribution of leadership between different individuals.<sup>6,7</sup> In the past few years, however, more focus has been dedicated to the conceptual frameworks of leadership development in the curricula of many graduate medical programs.<sup>8–13</sup> The rationale for this has been that the application of these frameworks within current training programs would contribute to the development of competent physician leaders.

Therefore, in addition to adequately preparing physicians for clinical practice, leadership education in health care is required for the transformation of current health systems as well as for promoting reliable and adaptive capacity that can manage the complexities of health care environments. Leadership itself is needed to optimize the clinical workplace, and make room for health care professionals to innovate and work towards a shared and local vision and mission. Well-trained physician leaders are therefore expected to foster a shared sense of purpose and community while encouraging peers and others to realize the personal benefits of autonomy and the pursuit of excellence in everyday work. In this line, the recent international movement towards competency-based education affords many national educational organizations with the opportunity to reframe the context of leadership in health care through a set of critical capabilities that physicians need to function at different levels of the health care system.<sup>14,15</sup>

## Our case

In 2014, a new practice management and leadership (PM&L) curriculum for postgraduate medical trainees was developed at our institution. This PM&L curriculum was a product of an extensive needs assessment survey involving medical residents and faculty in the Netherlands.<sup>16,17</sup> The content of the PM&L curriculum included ten topics, ranging from knowledge of the health care system to health care law and medical errors. A similar needs assessment performed amongst consultants (and residents) practicing in the Netherlands revealed that “legal aspects of medical errors” was one of the highly ranked topics that residents needed additional training in.<sup>17</sup> This finding, in combination with the growing complexities of the Dutch health care system and the rising

number of litigation cases against physicians, indicated that it was potentially possible that doctors were not adequately prepared to face the changing landscape of health care within their communities. The findings also revealed that many physicians in current clinical practice in the Netherlands lacked sufficient knowledge of the rules and regulations they had to abide by in the performance of their tasks. In situations where they did, they struggled to implement these efficiently in practice, further indicating that there is a need to educate physicians and trainees about the legal aspects of health care delivery. We, therefore, decided to embark on a project to develop a leadership training module in health care law and medical errors for medical residents in our institution. This theme was also one of the ten themes we identified from the needs assessment survey we conducted.

As mentioned earlier, postgraduate medical education continues to face various challenges including how to determine the best approach to prepare trainees for modern health care systems.<sup>18</sup> A new and growing problem, however, is the phenomenon of different “generational” expectations otherwise known as the “generational gap”. The impact that the generational gap has had on the educational expectations of the Baby Boomer generation (i.e., workaholic, knowledge-driven specialists) and the Millennial residents (i.e., collaborative, technologically adaptive, feedback-driven) has also been described in the literature.<sup>18,19</sup> Indeed, from the 1950s onward, there was a movement away from the traditional “lecture-style” method of teaching to a more active learning process. With universities slow to adopt online learning experiences at the advent of the digital age, because they feared it would lead to the disappearance of face-to-face class time and “brain drain” of their institutions, the generational gap kept increasing. Recently however, these views have become more nuanced, with the advent of e-learning materials and highly interactive, efficient, face-to-face class to facilitate the learning process.<sup>19</sup> Also, the flipped classroom was recognized as an educational approach that supports these developments and, apparently, demonstrates how the process can be applied in practice. Hence, this article serves as a proof of concept, and describes how we used the flipped classroom model for a PM&L curriculum for medical residents in the Netherlands.

## Our intervention

In our quest to identify and design an effective instructional intervention for leadership development in medical residents, we embarked on a pilot project that would investigate if the flipped classroom could be a suitable pedagogical approach. The rationale for choosing the flipped classroom for this module

was twofold. The first reason was that of the knowledge that different educational needs and expectations of various generations call for new teaching modalities.<sup>18,20</sup> The second was because the flipped classroom specifically helps the learner to progress quickly beyond the mere understanding of the theoretical subject to higher order cognitive skills such as evaluation and application of knowledge in practice settings. We chose the theme of “health care law and preventing medical errors” for this purpose, as it was an item identified from previous needs assessment (Busari JO. Longitudinal curriculum for leadership development. Unpublished manuscript, 2014).<sup>16,17</sup> We applied the instructional design methodology described by Lockyer et al and formulated the required intended learning outcomes (ILOs) using Bloom’s taxonomy (revised edition).<sup>14,21–23</sup> The ILOs were divided into lower- and higher- order learning activities to provide both teachers and residents with a structured guideline on the aims and expectations of the module.<sup>21</sup>

Before having the residents attend the training module, they were asked to complete a web-based 30-item validated multiple-choice questionnaire, which tested their current knowledge of health care law and preventing medical errors. The purpose of this survey was to trigger active learning stimulated by structured discourse within the flipped classroom model. Pre-class assignments that focused on understanding and remembering lower order cognitive concepts were also developed upfront. The residents were sent the pre-class exercise after completing the questionnaire. We did not use a separate virtual learning environment (VLE) for instruction, although homework materials in the form of online educational resources (e.g., e-journals and e-books) were provided. The residents were also encouraged to consult several open-access videos on both of the topics and complete assignments based on the educational materials. Class time was divided into two sessions of two hours each for health care law and medical errors, respectively. Based on the findings from earlier research,<sup>24,25</sup> one content expert and one field expert were recruited to conduct the training. Each expert was responsible for a session, and the content and format of each training module were carefully revised before implementation.<sup>21,24,25</sup>

Our objective for choosing this approach was to enable the students to obtain a thorough understanding of the ILOs, and to acquaint themselves adequately with the preparation materials, exercises, in-class content and with the concept of the flipped classroom as a teaching method. Higher order active learning strategies such as application and evaluation of knowledge were encouraged through the case-based discussion, debate and role plays.<sup>21,22</sup> At the end of the training

module, the residents were asked to provide feedback on their experience. A group evaluation was conducted based on participant consensus ratings (scale: 1 = very poor; 10 = excellent) in the following areas: 1) the quality of content and preparation (7.5), 2) trainers’ instructive skills (8.0), educational climate (8.0) and the level of interaction (9.0). Finally, the residents’ evaluation of the training module as a whole yielded an average score of 8.3 (range 8.0–9.0).

## Discussion

The flipped classroom is a well-known pedagogical model that in essence “flips” or reverses the two aspects of more traditional models of teaching, that is, the homework and class sessions.<sup>22,26</sup> Within the traditional model, students prepare for the class session by reading textbook materials, and the classroom session that follows is often teacher-centered, usually in the form of a lecture (i.e., a passive process).<sup>26,27</sup> In contrast, the flipped classroom model includes an active preparation and in-class delivery process.<sup>28</sup> The students receive triggering, practical questions and a list of literature and audio/video materials from which they may source their information. Basic concepts are learned ahead of the class so that class time can be devoted to “higher order learning activities” such as discussions and practical scenarios.<sup>21,28–31</sup> Therefore, students quickly progress from acquiring basic, factual knowledge to adopting new cognitive skills that can be used in the practical setting. In using this model, the class becomes a strong, student-centered environment where the expert takes on the role of facilitator.<sup>14,29</sup>

There are multiple benefits to the flipped classroom model. First, the design resonates with the educational needs of all generations of students, but especially to the Millennial generation through high intrinsic levels of interaction and collaboration.<sup>18,19,22</sup> Second, it allows the student to select his/her preferred learning style, controlling both time and speed.<sup>19</sup> In essence, it allows the students to take “responsibility for their own education”.<sup>22,32</sup> Third, both student–teacher and student–student interaction times are optimized.<sup>22</sup> Also, external experts can be recruited, which would otherwise not have been possible given both time and geographical constraints.<sup>22</sup> Finally, and most importantly, the model allows for the direct application of newly acquired knowledge to the practical setting.

In the pilot project we conducted, we discovered that the flipped classroom was an instructional method that resonated well with the expectations of the cohort that participated in the exercise. This observation is crucial for curriculum developers, especially when complex and abstract topics

need to be taught. It also offers a promising prospect as an instructional method to teach leadership development in postgraduate medical education. The flipped classroom, on the other hand, is not without its caveat. For example, the design and development of the training module took a considerable amount of time and effort to complete.<sup>22</sup> One can argue however that when instructors are more familiar with the flipped classroom model and a clear framework has been developed, it can be easily reused in other modules saving on the amount of time that was initially invested in developing the module. Critics of this method of instruction may also argue that there are potential drawbacks on the preparatory materials and exercises. For example, there is the risk of using technology (i.e., VLEs and video content) for the sake of technology.<sup>26</sup> Contrary to popular thought, however, the driving factor behind the success of the flipped classroom is not the availability and use of prerecorded video material as the role of technology lies in supporting a “sound pedagogical teaching strategy”.<sup>22,26,33</sup> The second point is that it is essential that students have a high intrinsic motivation to guard their educational process.<sup>22</sup> Finally, there is the risk of burdening residents with too much reading material as preparation involves a time investment, and this can be challenging in the highly demanding medical setting.<sup>22</sup> In addition, it should be noted that our study was conducted in a single country. Therefore, the generalizability of this study should be explored in future studies.

In summary, the flipped classroom is an effective educational approach because of its capacity to enhance learning beyond a mere understanding of theory to the development of higher order cognitive skills.<sup>18</sup> This occurs through the process of promoting active learning that focuses on a learner’s educational gap. In the preclinical years, this gap tends to be a knowledge gap (either understanding or application), but in real practice, the difference tends to be more of a performance gap. What is currently missing in the literature, however, is how (in clinical or residency programs) the flipped classroom can address the performance gaps. In this article, we highlighted a potential way of achieving this objective based on our local needs and how we set out to solve them. Finally, we are aware that developing a curriculum that focuses on content knowledge makes sense, although it may not be sufficient to achieve performance-oriented learning outcomes. Therefore, we believe a more rigorous program evaluation would be needed that can provide not only an in-depth understanding of what worked but also some understanding into how it worked. Indeed, learning about medical errors and health care law is one thing (cognition), while exercising

medical leadership using those content domains is another (performance). The former case was, however, the primary focus of this study.

## Conclusion

The purpose of this article is to explore how a nontraditional instructional method (i.e., flipped classroom) could be used to teach a module of a health care leadership curriculum in our institution. The rationale for choosing this instructional method was based on the perceived expectations of residents as Millennial learners and the instructive value of the flipped classroom as a teaching methodology. We do recognize that evidence on long-term performance in the clinical setting is currently lacking. However, this was not the purpose of this project, and as far as we know, it is the first time that the flipped classroom model is being applied to a leadership training within postgraduate medical education. We believe that the flipped classroom model is a useful educational tool that addresses the learning needs of Millennial residents and should, therefore, be used more frequently in postgraduate medical education.

## Disclosure

The authors report no conflict of interest, financial or otherwise, in this work.

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