Fostering Equity, Diversity, and Inclusion: Tools and their Implementation in Medical Physics Education

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2026 JOINT AAPM | COMP MEETING
JULY 19–22 | VANCOUVER, BC

Introduction

This work presents innovation in integrating equity, diversity, and inclusion (EDI) in teaching through the development of novel open educational resources and their implementation in medical physics graduate training.

Context: The AAPM and COMP recognize the critical importance of advancing EDI in medical physics, adopting the strategic goal of championing EDI. While there is growing awareness of challenges to EDI in science, individuals may lack knowledge and/or skills to effect change, and there are few tools/resources to empower action.

Methods

We developed two open educational resources to empower scientists to initiate actions to advance EDI:

- Teaching Toolkit: "Science is for everyone: Integrating equity, diversity and inclusion in teaching science and engineering – a toolkit for instructors" (**Fig. 1**);
- Research Pocket Guide: "Striving for inclusive excellence in science and engineering research: a pocket guide" (**Fig. 2**).

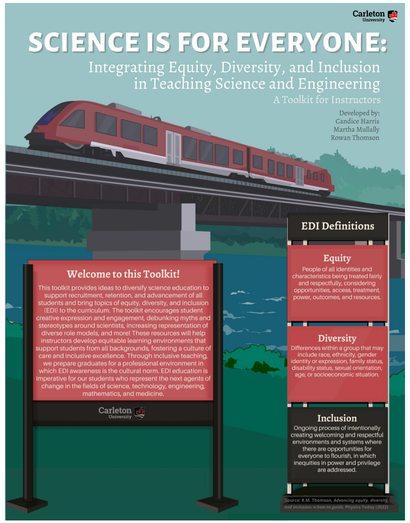
Both resources focus on practical, actionable ideas to engage with EDI. Actions, activities, and tools from these resources have been adopted to integrate EDI in medical physics graduate training.

Results

Specific practices to foster inclusive research and learning spaces, student-centered creative activities, and interactive workshops were integrated in medical physics training. Examples from within a CAMPEP graduate course include:

- Students' investigation of the importance of EDI considerations in medical physics professional practice and patient care; and
- Self-directed research to identify a medical physics hero based on the hero's contributions to the discipline and student's personal rationale.

Fig. 3 provides a glimpse of specific activities.



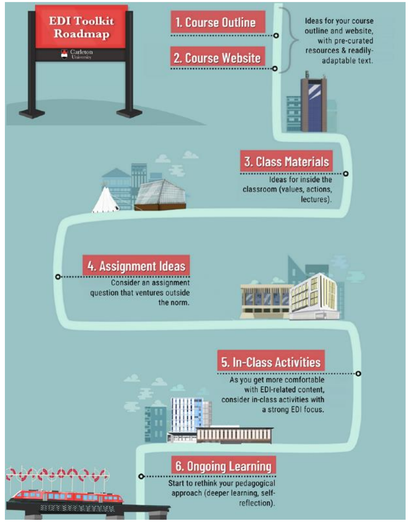
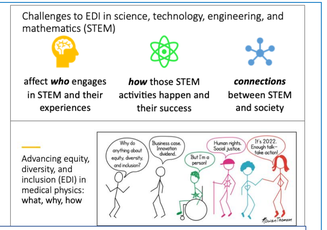


Figure 1: EDI in Teaching Toolkit, "Science is for Everyone" [1]: Cover page (left) and Graphical Table of Contents (right) for this 11-page practical, ideas-filled, and action-oriented resource.

Figure 2: EDI in Research Pocket Guide [2]: Cover page (left) and Graphical Table of Contents (above) for this 14-page guide packed with ideas, actions for all aspects of research adventures, and interactive activities for research teams.

Figure 3: Integrating EDI in Medical Physics Graduate Training.
Right: Snapshots of slides from teaching about EDI (cartoon is from Ref. 3).
Below: Assignment question from a course in our CAMPEP graduate program.



Questions from Assignment #1: The AAPM and COMP have initiatives to advance EDI. For some background on EDI in physics and science, first read "Advancing equity, diversity, and inclusion: a how-to guide". This problem encourages you to consider how EDI considerations affect those *who* are medical physicists as well as *how* medical physics activities happen.
(a) Consider "A First Look at Equity, Diversity, and Inclusion of Canadian Medical Physicists: Results From the 2021 COMP EDI Climate Survey". Does the article report disparities in representation amongst medical physicists compared to population-level statistics? What did you think about the analysis of EDI climate presented? [200 words]
(b) Now also consider "Equity, Diversity, and Inclusion Are Essential in Medical Physics'". Based on the three articles considered for this question, why is EDI important for medical physics? [200 words]

Conclusions

- The Teaching Toolkit and Research Pocket Guide are unique with their colourful graphics and novel collections of activities to engage with EDI in education and training.
- The potential for impact is high with both resources publicly released under creative commons licenses so that they can be readily adopted by other institutions.
- Feedback from students and colleagues has been overwhelmingly positive, with professionals at other institutions adopting these freely-available resources.
- It is hoped that the Toolkit and Pocket Guide will facilitate integration of EDI in medical physics training and beyond, catalyzing systemic change [4].
- Building on our successes, a novel interdisciplinary collaboration is embarking on the **EDIT-STEM** initiative, building an **EDI** Transformation for **STEM** with partner organizations that are STEM changemakers across sectors. Learn more: www.edit-stem.ca

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References

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2. Candice Harris, Maria Doria, Sara Siddiqi, Jennifer Bruin, Andrew Pullin, Natalina Salmaso, Hanika Rizo, and Rowan Thomson. 2025. Striving for Inclusive Excellence in Science and Engineering Research: A Pocket Guide. Zenodo, January 31, 2025. https://doi.org/10.5281/zenodo.14687350
3. Rowan. M. Thomson, Advancing equity, diversity, and inclusion: A how-to guide, Physics Today 75 (Issue 1), 42-49 (2022). https://doi.org/10.1063/PT.3.4921
4. Candice Harris, Jennifer E. Bruin, Martha Mullally, Maria Doria, Sara Siddiqi, Andrew Pullin, Natalina Salmaso, Hanika Rizo, and Rowan M. Thomson. 2025. Tools for transformation: a teaching toolkit and research pocket guide for advancing equity, diversity, and inclusion in science and engineering. FACETS. 10: 1-10. https://doi.org/10.1139/facets-2024-0122

Scan QR codes for free access to EDI resources:

"Advancing equity, diversity, and inclusion: a how-to guide" in Physics Today