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Le Companion curriculum : la perception des étudiants en médecine de l'intégration des sciences humaines dans la formation médicale

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Résumé de l'article

Contexte : L'apport des arts et des sciences humaines à la formation médicale est bien connu du milieu de l'enseignement médical, mais l'offre des programmes à cet égard varie d'une faculté à l'autre. Le Companion curriculum (CC) est un recueil de contenu facultatif en sciences humaines, préparé par des étudiants et destiné aux étudiants en médecine de l'Université de Toronto. En évaluant l'intégration du CC au programme de formation, cette étude vise à dégager les principales conditions propices à un engagement en faveur des humanités médicales.

Méthodes : Une évaluation à méthodes mixtes, à l'aide d'un sondage en ligne et de groupes de discussion, a permis de mesurer l'utilisation du CC par les étudiants en médecine et leur perception quant à l'intégration de cet outil. Les données narratives ont fait l'objet d'une analyse thématique, étayée par des statistiques sommaires de données quantitatives.

Résultats : La moitié des répondants au sondage connaissaient le CC (n=67/130 ; 52%) et, une fois qu'on le leur a décrit, 14 % en avaient discuté dans leurs groupes de tutorat. Parmi les étudiants qui l'avaient utilisé, 80 % ont déclaré avoir appris quelque chose de nouveau concernant leurs rôles de communicateur et de promoteur de la santé. Les thèmes abordés étaient la valeur perçue des sciences humaines, les réserves des étudiants, le manque d'intérêt envers les sciences humaines au sein des établissements d'enseignement médical, ainsi que les critiques et les recommandations formulées par les étudiants.

Conclusion : Malgré l'intérêt des participants pour les humanités médicales, notre CC demeure sous-utilisé. Nos résultats indiquent que le renforcement de la visibilité des sciences humaines dans le programme d'études médicales nécessite plus de soutien de la part des établissements, y compris par une formation des enseignants et par l'intégration des sciences humaines tôt dans le cursus du programme. Une étude plus approfondie permettrait d'explorer les raisons de l'écart entre l'intérêt et la participation.

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The Companion Curriculum: medical students' perceptions of the integration of humanities within medical education

Le *Companion curriculum* : la perception des étudiants en médecine de l'intégration des sciences humaines dans la formation médicale

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Abstract

Background: The contributions of arts and humanities to medical education are known in the medical education community, but medical schools' offerings vary. The Companion Curriculum (CC) is a student-curated set of optional humanities content for medical students at the University of Toronto. This study evaluates integration of the CC to identify key enabling conditions for medical humanities engagement.

Methods: A mixed-methods evaluation gauged usage and perceptions of integration of the CC among medical students using an online survey and focus groups. Narrative data underwent thematic analysis, supported by summary statistics of quantitative data.

Results: Half of survey respondents were aware of the CC ($n = 67/130$; 52%), and, once prompted with a description, 14% had discussed it in their tutorial groups. Of students using the CC, 80% reported learning something new regarding their roles as communicators and health advocates. Themes were the perceived value of the humanities, internal student barriers, institutional neglect of the humanities, and student critiques and recommendations.

Conclusion: Despite participants' interest in medical humanities, our CC remains underused. To improve humanities' visibility in the MD curriculum, our results indicate that greater institutional support, including faculty development and early curricular integration, is required. Further study should explore reasons for gaps between interest and participation.

Résumé

Contexte : L'apport des arts et des sciences humaines à la formation médicale est bien connu du milieu de l'enseignement médical, mais l'offre des programmes à cet égard varie d'une faculté à l'autre. Le *Companion curriculum* (CC) est un recueil de contenu facultatif en sciences humaines, préparé par des étudiants et destiné aux étudiants en médecine de l'Université de Toronto. En évaluant l'intégration du CC au programme de formation, cette étude vise à dégager les principales conditions propices à un engagement en faveur des humanités médicales.

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Résultats : La moitié des répondants au sondage connaissaient le CC ($n=67/130$; 52%) et, une fois qu'on le leur a décrit, 14 % en avaient discuté dans leurs groupes de tutorat. Parmi les étudiants qui l'avaient utilisé, 80 % ont déclaré avoir appris quelque chose de nouveau concernant leurs rôles de communicateur et de promoteur de la santé. Les thèmes abordés étaient la valeur perçue des sciences humaines, les réserves des étudiants, le manque d'intérêt envers les sciences humaines au sein des établissements d'enseignement médical, ainsi que les critiques et les recommandations formulées par les étudiants.

Conclusion : Malgré l'intérêt des participants pour les humanités médicales, notre CC demeure sous-utilisé. Nos résultats indiquent que le renforcement de la visibilité des sciences humaines dans le programme d'études médicales nécessite plus de soutien de la part des établissements, y compris par une formation des enseignants et par l'intégration des sciences humaines tôt dans le cursus du programme. Une étude plus approfondie permettrait d'explorer les raisons de l'écart entre l'intérêt et la participation.

Introduction

Humanities are increasingly utilized in medical education as a means of addressing and exploring the human condition.¹ This broad discipline comprising, among other disciplines, history, literature, philosophy, and art, allows students to access unfamiliar problems from unique perspectives.² Learning experiences with humanities in medicine correlate with numerous enhanced personal qualities and professional skills,¹⁻⁴ and the Association of American Medical Colleges (AAMC) insists that their inclusion plays a “unique and unrealized role” in preparing future physicians.⁵ Canadian medical schools vary significantly in their humanities programming:⁶ all seventeen include humanities learning, but these are not uniform experiences, not consistently evaluated, and do not include learner voices in their development.^{5,7}

At the University of Toronto, Case-Based Learning (CBL) is a weekly course component in which medical students analyze patient cases in small groups. The humanities offerings within CBL, the Companion Curriculum (CC), is unique in that it is assembled by medical students in the group ArtBeat (<https://utmedhumanities.wordpress.com/>) to encourage student-to-student exchange of ideas and texts, with the objective of enhancing students’ clinical education and developing their personal and professional identities. The CC is an optional resource containing contemporaneous humanities teaching such as poetry, literary stories, and art. It is unknown whether students utilize this resource, and what factors support or discourage its use. We therefore designed this study to evaluate usage and perceptions of CC integration in the University of Toronto MD Program, and to explore enabling conditions for its uptake.

Methods

We gauged learner perspectives using a mixed-methods evaluation based in the qualitative methods of phenomenology^{8,9} and quantitative assessment of CC usage and uptake.¹⁰

Data collection and participants

An online Qualtrics® (Qualtrics, Provo, UT) survey exploring CC utilization was advertised through email and social media, circulated to all University of Toronto medical students ($n = 1036$) in February 2020, and incentivized via email and social media, and a small prize draw (<\$25 value) incentivized participation. In March-July 2020, we held audio-recorded focus groups with year 1-2 students,

recruited by convenience sampling,¹¹ to understand their CC experiences. This study was approved by the University of Toronto Health Sciences Research Ethics Board (Protocol #29982).

Data analysis

Two independent researchers (CA, AG) inductively coded focus groups and survey data.^{8,12} Codes were iteratively applied, discussed with the team, and developed into a thematic framework.¹³ Validity was established through data-source, investigator, and theoretical triangulation.¹⁴ Quantitative data were analyzed using summary statistics.¹⁵

Results

Respondent characteristics

Survey initiation was 15% ($n = 153/1036$). Most respondents were in pre-clerkship ($n = 90/128; 70\%$) and female ($n = 102/128; 80\%$). Representative spread occurred across the school’s affiliated hospitals and healthcare sites.

We held two sixty-minute focus groups with seven pre-clerkship students. All three participants in focus group one (FG1) had humanities background (e.g. Bachelor of Arts degree, humanities interest group participation). One participant in the second (FG2) did; the remaining three lacked humanities backgrounds.

Quantitative results

Half of survey respondents were aware of the CC ($n = 67/130; 52\%$). Once prompted with a short CC description, few respondents discussed it in their groups ($n = 16/116; 14\%$). Table 1 illustrates CC use and preferences.

Narrative findings

We achieved thematic saturation after no new findings were uncovered in survey and focus group comments. Four themes were identified from triangulated focus group and survey comments: perceived value of humanities in medical education, internal student barriers to CC use, institutional neglect of humanities in medical education, and student critiques and recommendations (Table 2).

Perceived value of humanities in medical education.

Benefits of humanities in medical education arose from personal, professional, and global perspectives. One student shared that ambiguity in humanities “prepared [her] for [the challenges of medical school], because there’s no final interpretation of the story” (FG1-P1). The use of humanities in medical education was said to foster connection between students and patients, giving fullness

to illness experiences, and enabling personalized care. Patient connection then begets advocacy: “Truly good doctors understand the patient experience—they listen to their patients, they are also critical about their place in society and context historically, and who they are and what they represent” (FG1-P2).

Table 1. Use of companion curriculum among University of Toronto medical students.

Answer	Percent	Count
Did your CBL ^a group work through companion curriculum pieces together?		
Yes	1.72%	2
Sometimes	12.07%	14
No	86.21%	100
Have you read any of the companion curriculum pieces?		
Yes	53.49%	69
No	46.51%	60
For those students who answered yes: Did you learn something you didn't know before?		
Yes	81%	55
No	19%	13
What did you learn?		
Specific content	23%	10
Critical analysis skills	32%	14
Reasoning skills	14%	6
Other	32%	14
What is your first-rank preferred style of humanities teaching?		
Health history vignettes	37%	37
Music	6%	6
Poetry	9%	9
Literary short stories	26%	26
Visual art	17%	17
Other	4%	4
What is your preferred location for the CC within the curriculum?		
No preference	10%	10
Pre-week material	1%	1
Mid-week material	7%	7
Supplementary Readings	6%	6
CBL Discussion (as currently)	8%	8
Portfolio ^b	39%	40
Ethics/Longitudinal theme	20%	20
Other	10%	10

^aCBL = Case-Based Learning; ^bPortfolio = the program's small group reflection component

Internal student barriers to using the CC. Students shared many barriers impeding CC engagement, from time constraints to burnout to a lack of interest grounded in the “objectivity culture” of medical education: “People are very serious and scientific. And so it's hard to make space for [humanities]” (FG2-P7). Another agreed: “Our classmates think about results and outcomes and future career trajectories as quantitatively as possible ... it's really hard

to sell that humanities can make you a better person and a better doctor” (FG1-P3).

Institutional neglect of humanities in medical education. Students noted structural hurdles preventing effective integration of the CC—and humanities more broadly—into the medical curriculum. One student used anatomy to illustrate the school's priorities: “Anatomy, to do it well, takes an enormous amount of [the school's] resources [such as lab space, specimens, tutors]. Like, huge. And nobody's sitting there being like, ‘Oh we don't really need to put the resources into that.’ They're like, ‘No! We'll find a way to deal with the huge resource need.’” (FG1-P1). Many respondents felt the CC was invisible: “it's often hidden at the end of the case” (S#69); “did not know it existed” (S#13). Students also considered the issue of faculty development: “Even the tutors that have taken the time to go through the questions have never mentioned that slide” (FG2-P6).

Student critiques and recommendations. Students offered suggestions for improvement related to implementation, content, and nomenclature. “For [the CC] to be successful, it has to be presented in a way that adds value to people's lives without feeling like it's more work” (FG2-P7). Students diverged on whether it should be compulsory, but the idea of humanities streams was considered to offer “different mediums (sic) within the humanities curriculum” (FG1-P1). They made diverse content requests—visual art, film, author panels, first-person narratives, and comics. Students were also skeptical of the CC name: “Makes it sound like it's not an official curriculum; thus doesn't make me feel like I have to do it” (S#32). Suggested alternatives included “Humanities Curriculum,” “Narrative Component,” and “The Colors of Medicine.”

Table 2. Major themes underpinning student companion curriculum use.

Theme	Description	Quotations (source) ^a
Perceived value of humanities in medical education	Students recounted perceived goals and benefits of the arts in medical education, speaking from personal, professional, and global perspectives: Benefits to personal development referenced introspection, humility, empathy, and comfort with ambiguity. Professional benefits were captured in terms of patient connection and communication skills. Activism and advocacy were voiced as central features of the humanities.	“Literature allows you to form a subjective point of view on something and add some nuance into your perspective” (FG1-P3). “The humanities component after CBL ^b gives an idea of the patient’s experience, and therefore helps to understand ... what might be important to work on with them” (S#85). “Truly good doctors understand the patient experience—that they listen to their patients, that they are also critical about their place in society and context historically, and who they are and what they represent.” (FG1-P2).
Student barriers to using the companion curriculum	Students shared many barriers impeding CC ^c engagement. Time, burnout, student culture, and the content itself were obstacles identified to engagement with the CC. Students reflected on these barriers as byproducts of the culture of objectivity in medical education.	“Since it’s not tested, we don’t read it” (S#14). “I feel like I have enough work on my plate with the mandatory stuff to begin with” (FG2-P5). “Don’t find it important” (S#118). “Its unclear what the point of the activities are” (S#19). “Significance of the curriculum not really instilled” (S#42). “I think it’s hard; like it’s a very intense environment to begin with. And the people are very serious and scientific. And so it’s hard to make space for [the humanities] and even express it” (FG2-P7).
Institutional neglect of humanities in medical education	Students lamented the structural barriers preventing effective integration of the CC—and the humanities more broadly—into the medical curriculum. These challenges were discussed as issues of prioritization, visibility and promotion, and faculty development.	“It seems forced, random, irrelevant when taught out of context ... I personally value the humanities, but other students aren’t taught to value them” (S#90). “All the skills that I think I bring to being a good doctor, like I could easily not have any of those skills and do just as well in medical school. And it’s so frustrating ... why did you accept me in this program if those are the things that make me stand out, and made me seem like a great enough candidate to come in, but now that I’m in here, they seem completely useless?” (FG1-P1). “Tutors are expected, even if they’re not themselves experts in that field ... to understand the answer on the guide and deliver it appropriately” (FG1-P2).
Student critiques and recommendations	Survey and focus group responses offered numerous suggestions for CC improvement related to implementation, content, and nomenclature. Students differed on ideal CC location in the curriculum, suggesting the group reflection component (Portfolio), seminars, and lectures. More than where it sits, students were concerned about how to situate the CC appropriately.	“How is it actually going to be received; what’s actually going to happen when it’s out there in the world” (FG1-P2). “We need concrete teaching elsewhere in the curriculum that gives us tools for reflective writing and analyzing pieces of text” (S#130). “Even if [students] are being forced to do something humanities, if they have a choice between what they’re doing in humanities, I think that inherently makes them buy into it more” (FG1-P2).

^aFG1 = Focus Group 1, FG2 = Focus Group 2, P = Participant number, S# = Survey number. ^bCBL = Case-Based Learning. ^cCC = Companion Curriculum.

Discussion

Our study demonstrates that, despite some student interest, engagement with our program’s humanities curriculum is low. The themes underpinning this dichotomy relate to the perceived value of humanities, internal student barriers, institutional neglect of humanities in medical education, and student critiques and recommendations.

Dennhardt and colleagues present a continuum framework for humanities in medical education with three foci: art as expertise, art as dialogue, and art as expression and transformation.¹⁶ The AAMC Prism Model builds on this by proposing core functions in skill mastering, perspective-taking, personal insight, and social advocacy.⁵ Our findings depict humanities’ roles in similar terms: professional

development (art as expertise), personal development (art as dialogue), and advocacy and activism (art as transformation). Students valued the contributions to communication skills, perspective-taking, and inciting critique of norms, inequities, and injustices in healthcare.

Despite this, students seldom explored the CC with their CBL groups. Learners offered numerous impediments to CC engagement related to disinterest in content, lack of tutor training, and curriculum positioning. These ideas are consistent with Shapiro and colleagues’ grouping of learner critiques of medical humanities: (1) content relevance, (2) teachers and their methods, and (3) coursework positioning within the curriculum.¹⁷ Recent surveys demonstrate similar concerns.^{18,19} Our students are asking to be told the benefits of humanities. Its value is not made apparent by tutors, the administration, and the culture of

medical education. Students are pragmatic: if something is not assessed, it is not prioritized.

Underlying students' critiques are conceptual assumptions framing the art and science of medicine as distinct domains. Humanities were often said to require *buy-in*, meaning belief in value. Many recommendations assumed humanities need their *own* space. Humanities scholars have long justified the integration of humanities into medical education.^{2,20–22} However, its continued positioning as separate from biomedicine relegates humanities to peripheral roles. The University requires MD Program applicants to have one full-course in a social science, humanities, or language prior to acceptance.²³ But to ensure impact and support humanities scholarship once students arrive, systemic integration and improved visibility of humanities initiatives are needed.^{19,24,25}

Based on our findings, we provide practical recommendations on how to increase humanities uptake. Foremost, humanities programming should be formally introduced to students to underscore institutional support. Ideally, humanities content would be highlighted early, and students provided with a brief overview of its goals and expectations. Students also requested more tutor initiative, necessitating increased faculty development, and, ideally, selection of tutors with humanities training and interpretive experience. Faculty development may include Narrative Medicine workshops, online modules, and explicit tutor guide discussion points. We also encourage partnership with local arts organizations, scholars of higher education, creative arts therapists, artists, and patients. The AAMC provides a useful guide for educators looking to develop their arts curricula.²⁶ The program name should signal its importance. Finally, the full benefits of medical humanities cannot be provided in a short seminar. Volume and time are needed to introduce medical students to this necessary aspect of medical training. We recognize that the challenge of limited curricular time is not easily overcome. However, most Canadian and U.S. medical schools already offer humanities programs.⁵ Our findings can therefore be applied to schools hoping to expand their program offerings.

The CC has existed for over five years without formal assessment. This study's strengths include representative student survey responses, recruitment of diverse interviewees, robust data, interviewer, and methods triangulation. It is limited by its confinement to a single institutional context. Though many students (n=153)

accessed the survey, some responses were incomplete, and respondents were disproportionately female compared with the class (80% vs 55%). Nonetheless, participant insights were rich, informative, and useful for enhancing our student-curated educational innovation. Our findings can be applied to other schools aiming to enhance their own integration of humanities in medical education.

Conflicts of Interest: The authors have no funding sources or conflicts of interest to disclose.

References

1. Donohoe M, Danielson S. A community-based approach to the medical humanities. *Med Ed*. 2004;38(2):204-17. <https://doi.org/10.1111/j.1365-2923.2004.01756.x>
2. Macnaughton J. The humanities in medical education: context, outcomes and structures. *Med Humanities*. 2000 Jun 1;26(1):23-30. <https://doi.org/10.1136/mh.26.1.23>
3. Charon R, Trautmann Banks J, Connelly JE, et al. Literature and medicine: contributions to clinical practice. *Ann Intern Med*. 1995 Apr 15;122(8):599-606. <https://doi.org/10.7326/0003-4819-122-8-199504150-00008>
4. Mangione S, Chakraborti C, Staltari G, et al. Medical students' exposure to the humanities correlates with positive personal qualities and reduced burnout: a multi-institutional U.S. survey. *J Gen Intern Med*. 2018 May 1;33(5):628-34. <https://doi.org/10.1007/s11606-017-4275-8>
5. Howley L, Gauferberg E, King B. *The fundamental role of the arts and humanities in medical education*. Washington, DC: Association of American Medical Colleges; 2020.
6. Kidd MG, Connor JTH. Striving to do good things: teaching humanities in Canadian medical schools. *J Med Humanit*. 2008 Mar;29(1):45-54. <https://doi.org/10.1007/s10912-007-9049-6>
7. Peterkin A, Beausoleil N, Kidd Monica, Orang B, Noroozi H, Brett-MacLean P. *Medical humanities in Canadian medical schools: progress, challenges, and opportunities*. In: Bleakley A, editor. *Routledge Handbook of the Medical Humanities*. Abingdon, UK: Routledge; 2019. p. 364-80. <https://doi.org/10.4324/9781351241779-37>
8. Gibbs G. *Analyzing qualitative data* [Internet]. SAGE Publications Ltd; 2018. <https://doi.org/10.4135/9781526441867>
9. Patton CM. Phenomenology for the holistic nurse researcher: underpinnings of descriptive and interpretive traditions. *J Holist Nurs*. 2020 Sep;38(3):278-86. <https://doi.org/10.1177/0898010119882155>
10. Sargeant J. Qualitative research part ii: participants, analysis, and quality assurance. *J Grad Med Educ*. 2012 Mar;4(1):1-3. <https://doi.org/10.4300/JGME-D-11-00307.1>
11. Robinson OC. Sampling in interview-based qualitative research: a theoretical and practical guide. *Qual res psychol*. 2014 Jan 2;11(1):25-41. <https://doi.org/10.1080/14780887.2013.801543>

12. Auerbach C, Silverstein L. *Qualitative data: an introduction to coding and analysis*. NYU Press; 2003.
13. Saldana J. *The coding manual for qualitative researchers*. SAGE; 2015. 471 p.
14. Carter N, Bryant-Lukosius D, DiCenso A, Blythe J, Neville AJ. The use of triangulation in qualitative research. *Oncology Nursing Forum*. 2014 Sep 1;41(5):545-7.
<https://doi.org/10.1188/14.ONF.545-547>
15. Sarka D. *Descriptive statistics*. In: Advanced Analytics with Transact-SQL [Internet]. Berkeley, CA: Apress; 2021; p. 3-29.
https://doi.org/10.1007/978-1-4842-7173-5_1
16. Dennhardt S, Apramian T, Lingard L, Torabi N, Arntfield S. Rethinking research in the medical humanities: a scoping review and narrative synthesis of quantitative outcome studies. *Med Ed*. 2016;50(3):285-99.
<https://doi.org/10.1111/medu.12812>
17. Shapiro J, Coulehan J, Wear D, Montello M. Medical Humanities and their discontents: definitions, critiques, and implications. *Acad Med*. 2009;84(2).
<https://doi.org/10.1097/ACM.0b013e3181938bca>
18. Petrou L, Mittelman E, Osibona O, et al. The role of humanities in the medical curriculum: medical students' perspectives. In Review; 2020 Dec <https://doi.org/10.21203/rs.3.rs-72841/v1>
19. Strohbehn GW, Hoffman SJK, Tokaz M, et al. Visual arts in the clinical clerkship: a pilot cluster-randomized, controlled trial. *BMC Med Educ*. 2020 Dec;20(1):481.
<https://doi.org/10.1186/s12909-020-02386-w>
20. Povar GJ, Keith KJ. The teaching of liberal arts in internal medicine residency training. *J Med Ed*. 1984;59(9):714-21.
<https://doi.org/10.1097/00001888-198409000-00004>
21. Charon R. Narrative medicine: a model for empathy, reflection, profession, and trust. *JAMA*. 2001 Oct 17;286(15):1897-902.
<https://doi.org/10.1001/jama.286.15.1897>
22. Kidd DC, Castano E. Reading literary fiction improves theory of mind. *Science*. 2013 Oct 18;342(6156):377-80.
<https://doi.org/10.1126/science.1239918>
23. University of Toronto MD Program. *Academic requirements*. 2018 Available from: <https://applymd.utoronto.ca/academic-requirements> [Accessed on 2021 Jan 26].
24. Chisolm MS, Kelly-Hedrick M, Wright SM. How visual arts-based education can promote clinical excellence. *Acad Med* 2020 Dec 1. Publish Ahead of Print. Available from: <https://journals.lww.com/10.1097/ACM.0000000000003862> [Accessed on 2021 Jan 24].
25. Wald HS, McFarland J, Markovina I. Medical humanities in medical education and practice. *Med Teach*. 2019 May 4;41(5):492-6.
<https://doi.org/10.1080/0142159X.2018.1497151>
26. AAMC. *Getting started guide part 2: nuts and bolts of integrating arts and humanities into medical education* Available from: <https://www.aamc.org/what-we-do/mission-areas/medical-education/getting-started-nuts-bolts> [Accessed on 2022 Mar 8].