

1

Toward a collective understanding of medical education research: The DIMER dialogue instrument

Nabil Zary^{1*}, Chue Shien¹

¹ Medical Education Research and Scholarship Unit, Lee Kong Chian School of Medicine, Nanyang Technological University, City, Singapore

Corresponding Author:

Nabil Zary¹

Nanyang Technological University, Lee Kong Chian School of Medicine, 11
Mandalay Road, 308232 Singapore

Email address: nabil.zary@ntu.edu.sg

2
3 **Toward a collective understanding of medical education**
4 **research: The DIMER dialogue instrument**

5
6
7 **Abstract**

8
9 Medical education research embraces theoretical and methodological diversities.
10 Researchers are motivated by the quest for deepening knowledge as well as attracting
11 funding for new educational initiatives and technologies. However, it remains a daunting
12 endeavour to locate and aggregate findings into consistent themes [1]. Reasons are at
13 least twofold. The discourse of a discipline provides the language for representing its
14 work and crossing between disciplines is challenging. Secondly, medical education is
15 understood as an idiosyncratic collection of concepts appropriated from other educational
16 field and the medical education community is unsure about whether to construe medical
17 education as a medical or a social science [2, 3]. To overcome these challenges, we
18 propose a dialogue instrument that draws together cross cutting research perspectives,
19 stakeholders & learning domains to build bridges within medical curriculum, methods,
20 assessment and experiences research. Consequently, this dialogue instrument advocates a
21 nuance understanding of medical education research as a means for building collective
22 knowledge for impacting education and health outcomes.

23
24 **Key words:** interdisciplinary research; dialogue instrument; collective knowledge
25 building; medical education
26

27

28 **Main article**

29

30 *Current medical education research landscape*

31 Medical education research community is maturing in theoretical sophistication and
32 methodological rigour. Theories arising from behaviourist, humanist, and social learning
33 communities [4] currently frame the process of medical education [5]. The community is
34 also stepping away from focusing on the techniques used for data collection and analysis
35 [6] to making explicit research methodology and related epistemological and ontological
36 perspectives [7, 8]. Medical education research has indeed moved from its traditionally
37 isolated, small-scale approach to embrace a more eclectic, theoretically robust and
38 collaborative endeavour to improve the quality of its research base [5]. Importantly,
39 conversations are turning towards interdisciplinary collaborations impacting on education
40 policy and practice, enabling reach and significance locally, nationally and internationally
41 [9-11].

42

43 Medical education research is also motivated by the quest to attract funding for new
44 educational initiatives and technologies to drive medical learning experience. As a result,
45 technology has created new possibilities and made inroads in enhancing quality of
46 medical teaching and learning. Simulations, online learning platforms, use of mobile
47 devices by learners to access information in real time offers responsive support for
48 learners' development knowledge and skills [12]. These innovations have also changed
49 the face of assessment to allow for and recognition of evidence of learning as a
50 progression over time and series of learning activities [13]. These innovations have
51 twisted tradition classroom didactic teaching in its head to incorporate team-based
52 learning, video based studies, 3D anatomy practical sessions and flipped classroom
53 learning practices into medical education. Curriculum previously understood as a
54 discipline [14] is now understood as an experience that encompasses everything that is
55 happening to the student as well as staff who are significant and very influential
56 stakeholders in the institution or organisation [15].

57

58 Medical education research is characterised by its complex environment. It is daunting to
59 locate medical education research as a coherent programmatic whole despite major
60 developments in the area of medical curriculum and teaching, structure of
61 professionalism, characteristics and evaluation of medical learners and practitioners [16].
62 Medical education is constantly evolving for which events occur with or without research
63 to direct and evaluate activities. This is not helped when much of medical education
64 research is conducted within an applied, practical setting where people involved do not
65 have educational research as their first priority[17]. Certainly, it is also more comfortable
66 for researchers to adopt a discipline-specific view of the world where the discourse of a
67 discipline offers a language for representing its work[18].

68

69 Work has begun to frame medical education research as a collaborative process [19]. Yet,
70 barriers exist. First, medical education researchers are trapped in variants of the
71 quantitative and qualitative debate [1]. This is not helped when researchers continue to
72 hail randomized trials methods as the gold standard for medical education research [20,

73 21]. This obscures our understanding of humanistic experiences in the context of medical
74 education[22]. Second, for being theory-rich research at scale, the lack of sophistication
75 through collaborations is constantly dodging advancement of medical education research
76 [23]. Third, there is tension between those who see the need for educational research as
77 theory building and those who see the research as addressing practical needs [24].
78

79 Within this debate, experiences of stakeholders (patients, students, medical professionals)
80 are widely studied in medical education research, further debate should focus on how to
81 improve experiences by focusing on activities found to be associated with experiences
82 and outcomes and to develop robust measurement approaches [25]. Constant fixation on
83 causation research only serves to narrow the scope of understanding. Similarly,
84 assessment review reveal curriculum has gone the way of integration [26]. We need to be
85 flexible to accommodate micro analysis of curriculum design as well as cross boundary
86 study such as impact of assessment on student learning experiences. With varied forms of
87 research methods in use for medical education research, researchers need to rise above
88 the dichotomy of qualitative and quantitative research to ask questions that matters to
89 medical education and subsequently draw upon their theoretical underpinnings to guide
90 research design.
91

92 To rise above these issues, calls for interdisciplinary collaborative work with researchers
93 from other disciplines have begun. Rees et al argues for greater literacy in education to
94 sustain collaborations between education researchers across health professional schools
95 and schools of education [23]. Importantly, medical education settings are unique
96 microcosms that offers constantly evolving context for medical education research [17].
97 We need collaboration with colleagues from different perspectives to study a broader
98 array of outcomes to link medical education with health outcomes. In doing so, medical
99 education research needs to be situated within a general framework and asking questions
100 to push the field towards new knowledge.
101

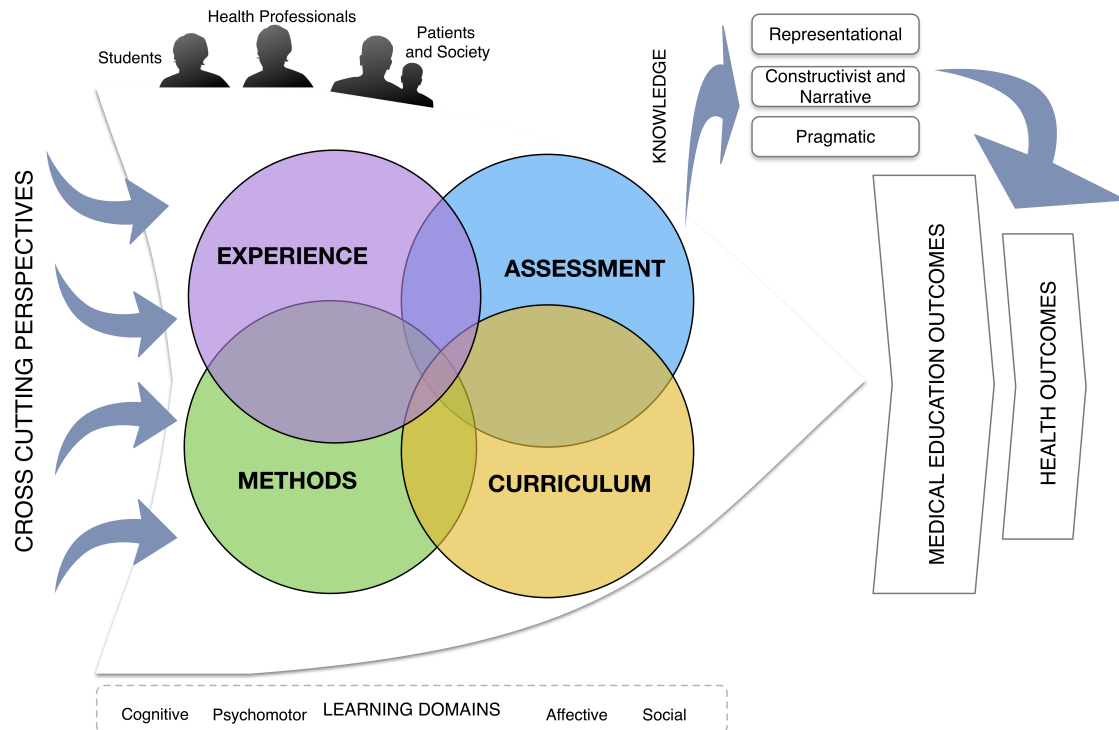
102 *Our hypothesis*

103 If we remain at the thematic understanding of medical education research, collective
104 knowledge for advancing practices will remain elusive. We need to build bridges to link
105 key research areas on medical education. These bridges include voices of stakeholders,
106 differing research perspectives and learning domains of medical education researchers.
107

108 *A dialogue instrument for collective understanding of medical education research*

109 We present an agile social-cultural model of scholarship & research that frees itself from
110 the typical dichotomy of qualitative versus quantitative research in at least two ways.
111 Firstly, learning domains in this ecosystem is understood across a continuum of
112 perspective from cognitive psychology (focus on part of individual) to Neo-Vygotskian
113 theories (focus on practice in a society and culture). Secondly, a cross cutting perspective
114 as the initial step turns typical medical research organized by listing research projects at
115 its head by foregrounding research as along a continuum of collaborative research on one
116 end and monodisciplinary practices on the other end which can be equally productive
117 [27]. In this way, medical education researchers can focus on solving the problem rather
118 than be limited by an individual disciplinary basis that quickly becomes the limiting

119 factor of a research process. This instrument (Figure 1) draws together stakeholders to
 120 understand the intricate links between people, practices, values and technologies
 121 sustaining medical education research.
 122



123
 124 Figure 1: Dialogue instrument for collective understanding of medical education research (DIMER)
 125

126 Cross cutting perspectives allows a rich diversity of approaches to medical education
 127 research. Underlying these perspectives are assumptions and worldviews of researchers
 128 and participants that can lead to variations in the ways research are designed and
 129 implemented. This instrument gives reason for students, professionals and patients to
 130 participate in medical education research as key stakeholders empowered and supported
 131 to make decisions at all stages of research.
 132

133 Supporting research within and between the overlaps of these domains are research
 134 philosophies that guide medical education research design. While the history of medicine
 135 and science is strongly rooted in positivism which places high value on understanding the
 136 world through objective study, more recently, medical education research has also
 137 expanded ways of knowing to include post-structuralist understandings that supports
 138 plurality of meanings and knowledge. As a result, our dialogue instrument's demand for
 139 perspectives such as behaviourist, cognitivist, humanist, social and constructivist theories
 140 of learning [28] can enrich medical education research.
 141

142 The typology of experience, assessment, curriculum and methods in medical education
 143 are drawn closer to overlap in research conversation by this dialogue instrument. As
 144 individual modes, curriculum is associated with classical models of learning objectives
 145 and aims. Assessment encompasses both formative and summative approaches often

146 framed in frameworks such as Millers' pyramid. Methods of medical education are varied
147 though underpinned by Flexner's 2+3 model. Experience in medical education is student
148 centred with investigations focusing on learning experience. Yet, a continuous focus on
149 individual modes is not going to reflect the web of mutual interdependency of these
150 modes. The proportions of curriculum, experience, assessment are not decided in advance
151 but worked out during the design and development of each project. For medical education
152 outcomes to move forward, the walls separating the individual modes of research context
153 needs to break down and modes need to coalesce through permeable boundaries. This
154 instrument aims to do just that.

155

156 This is not action research that seeks to bring together action, reflection, theory and
157 practice in participation with others in the pursuit of practical solutions [29]. In the
158 context of medical education research, this dialogue instrument is about working towards
159 interdisciplinary medical education research. Experimental design and randomized
160 controlled trials have an important place in medical research and have a privileged
161 position in the ladder of evidence synthesis. These are most appropriate in well controlled
162 situations. Medical education implies often complex situations where it is not possible to
163 control many variables. Measuring complex social change may not be the best way
164 forward. Rising above measurements, this dialogue instrument is an opportunity for large
165 scale collaborative research to test and further refine guidelines that inform choices about
166 quality and rigour of programmes in medical education, medical research as well as
167 healthcare services.

168

169 Constant communal reflection regarding our choices of research topics to address and our
170 success in addressing them is needed in order to integrate research in coherent
171 programmatic waves. The purpose of this dialogue instrument is not to impose a set of
172 themes for medical education research that should be considered comprehensive,
173 prescriptive, or definitive. Rather, we hope to create a knowledge-building community
174 where collective knowledge is a result of scholars working towards a shared goal. It is
175 only when we work more collaboratively to build mutual understanding that we can
176 acquire collective knowledge of the enterprise of medical education.

177

178 *Conclusion*

179 A fundamental goal of medical education is to educate trainees to provide high quality
180 patient care [30]. Yet much of medical education research has focused on assessment of
181 trainees' performance with the implicit assumption that satisfactory trainee performance
182 will translate into quality patient care. Undoubtedly, many difficulties arise in assessing
183 patient outcomes to gain insights into the quality of care which graduates provide. It is
184 unquestionably an arduous process of exploring strengths and weaknesses of the
185 educational programme from the perspective of actual outcomes in the field. Establishing
186 a link between patient outcomes, provider performance and medical education is
187 challenging. However, this dialogue instrument facilitates a future direction for medical
188 education research which may provide collective insight into the strengths and
189 weaknesses of our medical educational systems and processes. It also needs reminding
190 that this instrument is neither a diagnostic tool nor a result of meta-analysis of medical
191 education research literature. Importantly, this tool aims to offer a research space for

192 drawing people who are concerned with advancing medical education research for
193 enriching health outcomes. Unless we pay attention to social priorities, highlight
194 inefficient and ineffective education practices and encourage attention to care systems,
195 the ultimate intent of medical education to improve the health of patient is not going to
196 happen.

197

198

199 **References**

200 1. Prideaux D, Bligh J. Research in medical education: asking the right
201 questions. *Medical education*. 2002;36(12):1114-5.

202 2. Skelton J, Buckley S. What is the value of good medical education
203 research? A reply to Bligh and Brice. *Medical education*. 2008;42(10):1045-.

204 3. Monrouxe LV, Rees CE. Picking up the gauntlet: constructing medical
205 education as a social science. *Medical education*. 2009;43(3):196-8.

206 4. Mann KV. Theoretical perspectives in medical education: past experience
207 and future possibilities. *Medical education*. 2011;45(1):60-8.

208 5. Pugsley L, McCrorie P. Improving medical education: Improving patient
209 care. *Teaching and Teacher Education*. 2007;23(3):314-22.

210 6. Barbour RS. Checklists for improving rigour in qualitative research: a case
211 of the tail wagging the dog? *British medical journal*. 2001;322(7294):1115.

212 7. Derkx H, Rethans JJ, Maiburg B, Winkens R, Knottnerus A. New
213 methodology for using incognito standardised patients for telephone consultation
214 in primary care. *Medical education*. 2009;43(1):82-8.

215 8. Patterson F, Baron H, Carr V, Plint S, Lane P. Evaluation of three short-
216 listing methodologies for selection into postgraduate training in general practice.
217 *Medical education*. 2009;43(1):50-7.

218 9. Association BER. Why educational research matters: a briefing to inform
219 future funding decisions: British Educational Research Association; 2013.

220 10. Pollard A, Oancea A, editors. Unlocking Learning?: towards evidence-
221 informed policy and practice in education. Final report of the UK Strategic Forum
222 for Research in Education, 2008-20102010: Strategic Forum for Research in
223 Education.

224 11. National Foundation for Education Research. NFER impact review 2013
225 [cited 2016 5th July]. Available from: [http://www.nfer.ac.uk/about-nfer/strategy-
226 and-vision/Impact-Review-2013.pdf](http://www.nfer.ac.uk/about-nfer/strategy-and-vision/Impact-Review-2013.pdf).

227 12. Bullock A, de Jong PG. Technology-enhanced learning. *Understanding
228 medical education: evidence, theory and practice*. 2014:149-60.

229 13. Ruiz JG, Mintzer MJ, Leipzig RM. The impact of e-learning in medical
230 education. *Academic medicine*. 2006;81(3):207-12.

231 14. Deng Z, Luke A. The most basic curriculum question is what should count
232 as knowledge. There are perennial. *The Sage handbook of curriculum and
233 instruction*. 2007:66.

234 15. Genn J. AMEE Medical Education Guide No. 23 (Part 1): Curriculum,
235 environment, climate, quality and change in medical education—a unifying
236 perspective. *Medical teacher*. 2001;23(4):337-44.

- 237 16. Regehr G. Trends in medical education research. *Academic Medicine*.
238 2004;79(10):939-47.
- 239 17. Shea JA, Arnold L, Mann KV. A RIME Perspective on the Quality and
240 Relevance of Current and Future Medical Education Research. *Academic*
241 *Medicine*. 2004;79(10):931-8.
- 242 18. Barker C. *Cultural studies and discourse analysis: A dialogue on language*
243 *and identity*: Sage; 2001.
- 244 19. O'Sullivan PS, Stoddard HA, Kalishman S. Collaborative research in
245 medical education: a discussion of theory and practice. *Medical education*.
246 2010;44(12):1175-84.
- 247 20. Norman G. RCT= results confounded and trivial: the perils of grand
248 educational experiments. *Medical education*. 2003;37(7):582-4.
- 249 21. Torgerson CJ. Educational research and randomised trials. *Medical*
250 *education*. 2002;36(11):1002-3.
- 251 22. Lindlof TR, Taylor BC. *Qualitative communication research methods*:
252 Sage; 2010.
- 253 23. Rees C, Francis B, Pollard A. The state of medical education research:
254 what can we learn from the outcomes of the UK Research Excellence
255 Framework? *Medical education*. 2015;49(5):446-8.
- 256 24. Albert M. Understanding the debate on medical education research: A
257 sociological perspective. *Academic Medicine*. 2004;79(10):948-54.
- 258 25. Manary MP, Boulding W, Staelin R, Glickman SW. The patient experience
259 and health outcomes. *New England Journal of Medicine*. 2013;368(3):201-3.
- 260 26. Brauer DG, Ferguson KJ. The integrated curriculum in medical education:
261 AMEE Guide No. 96. *Medical teacher*. 2015;37(4):312-22.
- 262 27. Toomela A. Culture of science: Strange history of the methodological
263 thinking in psychology. *Integrative Psychological and Behavioral Science*.
264 2007;41(1):6-20.
- 265 28. Merriam SB, Caffarella RS, Baumgartner LM. *Learning in adulthood: A*
266 *comprehensive guide*: John Wiley & Sons; 2012.
- 267 29. Reason P, Bradbury H. *Handbook of action research: Participative inquiry*
268 *and practice*: Sage; 2001.
- 269 30. Prystowsky JB, Bordage G. An outcomes research perspective on medical
270 education: the predominance of trainee assessment and satisfaction. *Medical*
271 *education*. 2001;35(4):331-6.

272

273

274

275