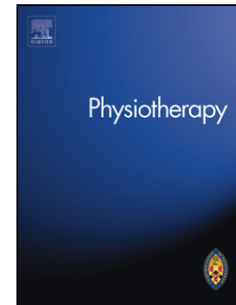


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Investigating physiotherapy stakeholders' preferences for the development of performance-based assessment in practice education

A. O'Connor N. Krucien P. Cantillon M. Parker A. McCurtin



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5 **Authors:** O'Connor, A.,^{a,b} Krucien, N.,^c Cantillon, P.,^d Parker, M.^e and McCurtin, A.^{a,b}

6 **Affiliations:**

7 a. School of Allied Health, Health Sciences Building, University of Limerick, Castletroy,
8 Limerick, Ireland, V94 T9PX.

9 b. Health Research Institute, University of Limerick, Castletroy, Limerick, Ireland, V94
10 T9PX.

11 Email: Anne.OConnor@ul.ie

12 Email: Arlene.McCurtin@ul.ie

13 c. Health Economics Research Unit, University of Aberdeen, Aberdeen, AB25 2ZD,
14 Scotland.

15 Email: Nicolas.Krucien@abdn.ac.uk

16 d. Discipline of General Practice, Clinical Science Institute, National University of Ireland,
17 Galway, Ireland, H91 TK33.

18 Email: Peter.Cantillon@nuigalway.ie

19 e. Department of Physical Education and Sports Sciences, University of Limerick, Castletroy,
20 Limerick, Ireland, V94 T9PX.

21 Email: Missy.Parker@ul.ie

22 **Corresponding Author:** Anne O'Connor, School of Allied Health, Health Sciences
23 Building, University of Limerick, Limerick, Ireland.

24 **Tel:** +353 61 233279/ +353 86 8523977 **Fax:** +353 61 234251

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37

38 **ABSTRACT**

39 **Objectives**

40 Discrete choice experiments (DCEs) are used in healthcare to measure the relative
41 importance that stakeholders give to different features (or attributes) of medical treatments or
42 services. They may also help to address research questions in health professional education.
43 Several challenges exist regarding the performance-based assessment process (PBA)
44 employed in physiotherapy practice-based education, a process which determines students'
45 readiness for independent practice. Evidence highlights many commonalities among these

46 challenges, but it is unknown which factors are the most important to stakeholders. The use
47 of DCE methodology may provide answers and help to prioritise areas for development.

48 Thus, this study employed DCE to identify clinical educators', practice tutors and
49 physiotherapy students' preferences for developing the PBA process in physiotherapy.

50 **Design**

51 Attributes (aspects of the PBA process known to be important to stakeholders) were derived
52 from focus group interviews conducted with three groups; physiotherapy students, clinical
53 educators (practising clinicians) and practice tutors (dedicated educational roles in the
54 workplace). These attributes included the PBA tool, grading mechanisms, assessors involved,
55 and, feedback mechanisms. Preferences for each group were calculated using a logistic
56 regression model.

57 **Results**

58 Seventy-two students, 124 clinical educators and 49 practice tutors (n=245) participated.

59 Priorities identified centred primarily on the mandatory inclusion of two assessors in the PBA
60 process and on refinement of the PBA tool.

61 **Conclusion**

62 Employment of DCE enabled the prioritisation of stakeholder-informed challenges related to
63 PBA in physiotherapy practice-based education. This corroborates findings from previous
64 qualitative work and facilitates a prioritised pathway for development of this process.

65 **Contribution of the paper**

- 66 • The employment of discrete choice experiment methodology provided a stakeholder-
67 centred method of identifying the relative importance of factors related to
68 improvement of the PBA process in practice-based education. This methodology
69 should be considered by other health professions seeking answers to similar research
70 questions.

- 71 • Findings demonstrate overwhelming agreement among physiotherapy students,
72 clinical educators and practice tutors regarding the need for two assessors in the
73 performance-based assessment process of physiotherapy students.
- 74 • Findings reflect a need for shared responsibility of high stakes decision making
75 regarding students' readiness for independent practice as well as the need for greater
76 transparency in this assessment process.
- 77 • Findings highlight the perceived value of a dedicated educational role in the
78 workplace for both physiotherapy students and clinical educators.

79 **Keywords:** performance-based assessment; physiotherapy; student, discrete choice
80 experiment.

81

82 **Introduction**

83 Stakeholder opinion is increasingly regarded as an essential element in the planning
84 and implementation of health-related research, education and policy. The involvement of
85 stakeholders enables researchers and developers to make better-informed decisions as well as
86 empowering stakeholders to shape research, policy and education (1, 2). In physiotherapy
87 education, many concerns exist regarding the performance-based assessment (PBA) of
88 students in the workplace, that is, the assessment process which ultimately determines their
89 readiness for independent practice (3-7). However, limited evidence exists regarding
90 stakeholders' priorities for its development. A stakeholder-centred research design would
91 contribute to a comprehensive understanding of this assessment process helping to prioritise
92 key areas demanding development.

93 The stakeholders primarily concerned with PBA in the physiotherapy workplace are
94 physiotherapy students and work-based educators. In the Republic of Ireland, two types of

95 work-based educators exist; clinical educators, primarily service providers who voluntarily
96 undertake student supervision, and practice tutors who are qualified clinicians employed to
97 provide dedicated educational support to students and clinical educators but who do not
98 engage in service provision (3, 4). These are often employed in large teaching hospitals or
99 regions where large numbers of students are accommodated at one time. Notwithstanding, in
100 physiotherapy education globally, clinical educators provide up to one third of the academic
101 content of university programmes through practice-based modules (8, 9) thus highlighting
102 their significant contribution to the preparation of physiotherapy students for practice.

103 Specific challenges encountered with PBA by clinical educators are linked to the
104 multiplicity of roles they perform (4, 6, 7, 10). Arguably, one of the major difficulties
105 encountered is that clinical educators must juggle service provision with requirements for
106 student observation and mentoring (4). Such competing demands may influence the
107 achievement of a comprehensive account of student performance which can manifest itself in
108 student dissatisfaction. Practice tutor roles may offer potential solutions to these challenges,
109 as highlighted by physiotherapy students and clinical educators in recent literature (3, 4, 8).
110 Further challenges have been identified related to the training and support received by
111 clinical educators from their academic colleagues (3, 6) and problematic communication
112 channels between these two cohorts of education providers (6, 7). Prioritisation of these
113 factors and their resultant needs is necessary to direct change in education policy and
114 practice. This is particularly important in the context of the clinical workplace where the
115 struggle between service delivery and education provision is often a significant barrier to
116 undertaking student supervision (11, 12).

117 To our knowledge, no study has investigated workplace-based educators' or students'
118 preferences for improving the PBA process in practice-based physiotherapy education. This
119 knowledge would provide universities and accreditation bodies with a cornerstone for

120 developing the process while ensuring that those stakeholders who engage with the process
121 on a daily basis have their say. A qualitative study, conducted in the Republic of Ireland, to
122 determine physiotherapy students', practice tutors' and clinical educators' perceived
123 challenges and facilitators of the current PBA process preceded and informed the current
124 study (3, 4). This information was used to undertake a Discrete Choice Experiment in order
125 to identify and prioritise these stakeholders' preferences for improving this process in
126 physiotherapy education.

127 **Methodology**

128 *Ethics approval*

129 All four physiotherapy schools in the Republic of Ireland were invited to participate
130 and three of these expressed an interest in being involved. Research ethics approval was
131 granted by all three. Permission was also granted by the Irish Society of Chartered
132 Physiotherapists to disseminate the survey to their members.

133 *Discrete Choice Experiment*

134 Discrete Choice Experiments (DCEs) are widely used in healthcare and more recently
135 in health professional education to measure the relative importance that stakeholders give to
136 different features (or attributes) of medical treatments or services (13-16). Information
137 regarding preferences is obtained by asking participants to choose between hypothetical
138 descriptions of the service of interest (e.g. *which treatment do you prefer? A or B?*). These
139 hypothetical scenarios are known as choice sets and usually contain two or more competing
140 alternatives (or choice options) (See Figure 1 for example of choice set used in this study).

141 INSERT FIGURE 1 HERE

142 In line with recommendations for DCE design (17, 18), focus groups were conducted
143 with three stakeholder groups; physiotherapy students (n=33), clinical educators (n=27) and
144 practice tutors (n=19) in order to inform the DCE. These focus groups identified

145 stakeholders' perceived challenges and facilitators of the current PBA process and their
146 priorities for its development (3, 4). This data informed the selection of attributes for the
147 DCE, i.e. following thematic analysis (19) of focus group data, the first and last author reread
148 all transcripts independently and collaboratively identified attributes reflecting the most
149 relevant challenges of PBA in the physiotherapy workplace. In this case, four common
150 attributes were identified; the PBA tool, grading mechanisms, assessors, and feedback
151 mechanisms. Four attribute levels were defined for each attribute. Based on guidelines (17,
152 18), attribute levels should represent hypothetical solutions for each attribute identified. Thus,
153 one of these represented the current state of PBA in physiotherapy education, the other three
154 provided hypothetical improvements related to each attribute (Table 1).

155

156 INSERT TABLE 1 HERE

157 *Experimental Design*

158 The choice sets were obtained by experimentally combining the attributes' levels into
159 hypothetical descriptions of PBA. As a full factorial design (i.e., all possible combinations of
160 attributes' levels) would have led to an unmanageable number of choice sets for the
161 respondents (i.e. $4^4 = 256$), a fractional design known as an orthogonal main effects plan
162 (OMEF) (20) was used which consisted of 16 choice sets. Thus, the DCE investigated
163 stakeholders' preferences for four key aspects of the PBA process in physiotherapy by
164 presenting 16 choice sets, one choice set at a time, and asking participants whether they
165 would accept the hypothetical changes in the proposed PBA package or not (see Figure 1 for
166 an example of one choice set question). Each participant received the same 16 choice sets,
167 but randomised, to eliminate question order bias. An online choice questionnaire was
168 developed using Survey Monkey software (www.surveymonkey.com) following guidelines
169 for reporting internet-based surveys (21). A pilot study was conducted with a convenience

170 sample of six students, three practice tutors and three clinical educators to check for
171 readability, clarity of instructions and survey time. An iterative process occurred until
172 agreement was achieved regarding survey clarity.

173 ***Recruitment***

174 *Practice tutors and clinical educators*

175 Practice tutors and clinical educators were contacted via an agreed gatekeeper of the
176 Irish Society of Chartered Physiotherapists. The same survey link was sent to all members of
177 this group via email. Eligibility was restricted to those who had been involved in student
178 supervision and assessment in the previous two years. This was to ensure participants'
179 familiarity with the PBA process.

180 *Students*

181 The heads of department of participating schools acted as gatekeepers for student
182 recruitment. Undergraduate physiotherapy students who had completed at least one assessed
183 practice-based module were eligible to participate. A DCE survey link was sent via email by
184 the gatekeepers to eligible students. This outlined the rationale for the study, as well as
185 information on how to complete the survey and the approximate time for completion. The
186 first question was mandatory and related to informed consent. No identifiable details were
187 required from any of the stakeholder groups, IP addresses were used as a check to ensure that
188 participants did not respond twice. Each of the surveys remained open for four weeks, with
189 two reminders sent via gatekeepers. Demographic information for all three stakeholder
190 groups is shown in Table 2.

191

192 INSERT TABLE 2 HERE

193 ***Sample size***

194 A sample size calculation was conducted prior to disseminating the survey. Formal power
195 computation was not possible as it would have required information about preferences for the
196 attributes. Such prior information was not available in the literature. As an alternative we
197 used Louviere et al's formulae (22) to determine the minimum sample size needed for the
198 DCE. However, this formula could only approximate the minimum sample size needed, being
199 initially developed for choice proportions (rather than preference estimates). Therefore, a
200 conservative strategy consists of recruiting more participants than the minimum number
201 needed (22,23). In our study, given 16 choice tasks per respondent, an accuracy level of 90%
202 (β (level of accuracy) = 0.9) and a confidence level of 95% ($\alpha = 0.05$), a minimum of 28
203 participants was required for each of the three groups.

204 **Data Analysis**

205 A logistic regression model was used to quantify the influence of changes in PBA
206 attributes on respondents' choices. In this model, the dependent variable was the binary
207 decision made by the participants in every choice task (*i.e.* *would you be satisfied to*
208 *implement this option? Yes / No*) and the predictors were the values taken by the four PBA
209 attributes. To account for the panel nature of the data (*i.e.* multiple choices per respondent) an
210 individual-level error term was added to the model. The four PBA attributes entered the
211 model as dummy coded variables such that each estimate captured the effect of the particular
212 category relative to a reference level (*e.g.* for the attribute 'PBA Tool' the reference level was
213 'Clinical Reasoning'; for the attribute 'Grading Mechanism', the reference level was
214 'Pass/Fail' etc. (See Table 3). The numbers in Table 3 are maximum likelihood estimates
215 (MLEs) of marginal utilities. They describe the effect of moving from a reference category of
216 the attribute (*e.g.*, "Clinical Reasoning" for PBA tool attribute) to another level of that
217 attribute (*e.g.*, "Criteria" for PBA tool attribute). Therefore, a positive effect indicates an
218 improvement in the assessment method (*e.g.*, students would prefer to improve the clarity of

219 the PBA tool descriptors rather than awarding greater weighting to clinical reasoning within
220 the PBA tool). In the DCE literature, MLEs are typically reported because the two main
221 results of interest are (1) significance of effects and (2) direction of effects.

222 **Results**

223 *Response rate*

224 *Practice tutors*

225 At the time of survey dissemination, 55 practice tutors were employed nationally and
226 all 55 responded. Datasets were excluded where less than 50% of the choice set questions
227 were completed. Thus, 49 datasets were included in the final analysis, providing 783
228 observations (0.1% missing values) and a response rate of 89%.

229 *Clinical educators*

230 Two hundred and seventeen clinical educators responded. One hundred and twenty four
231 datasets were included in the final analysis. This provided 1,917 observations in total (3.3%
232 missing values). As no central database of clinical educators exists in the Republic of Ireland,
233 an exact response rate could not be calculated for this group but it was estimated at 45%
234 based on the ratio of students to educators for the given sample.

235 *Students*

236 In total 240 students were eligible to participate; 110 students responded. Seventy-two
237 datasets were included in the final analysis providing 1,129 observations in total (2% missing
238 values). This represented a response rate of 30%.

239

240 *DCE findings*

241

242 *Practice tutors*

243 Practice tutors' highest preferences for the development of the PBA process related to
244 the composition of assessors involved in the PBA process and improvements directed at
245 refining the PBA tool (Table 3). The highest overall preference was for the involvement of
246 *both* a clinical educator and a practice tutor in the PBA process. This was found to be
247 significantly more desirable than their second highest preference which was for the
248 involvement of two clinical educators in the PBA process. Both of these preferences were
249 almost twice as desirable as the involvement of one clinical educator (Table 3). Practice
250 tutors' third highest preference related to refinement of the PBA tool where they prioritised
251 the avoidance of duplication of learning outcomes and the identification of safety as a
252 pass/fail learning outcome which would override all other learning outcomes in the PBA tool.
253 There was no significant difference between these two preferences. Overall, the practice tutor
254 groups' two highest preferences were almost three times more desirable than their third
255 preference.

256 INSERT TABLE 3 HERE

257 *Clinical educators*

258 Clinical educators' highest preference was also for the involvement of *both* a clinical
259 educator and a practice tutor in the PBA process. This was found to be significantly more
260 desirable than their second highest preference which was for the involvement of two clinical
261 educators in the PBA process. Their third preference also identified the need for refinement
262 of the PBA tool, but differed from the practice tutor group, in that they prioritised greater
263 objectivity in criteria used to define the achievement of learning outcomes. None of the
264 attribute levels related to grading mechanisms or student feedback mechanisms reached
265 statistical significance in either the practice tutor or clinical educator groups.

266 *Students*

267 Overall, students' highest preferences were similar to those of the educator groups
268 (Table 3). Their highest preferences related to the involvement of two assessors in the PBA
269 process. No significant difference was found between the attribute levels 'PT and CE' and
270 'Two CE' in the student group. Students' third highest preference was the same as the clinical
271 educator group, reflecting a demand for greater objectivity in criteria used to define the
272 achievement of learning outcomes. Overall, students' first and second preferences were
273 almost twice as great as their third highlighting that students' priorities primarily centred on
274 the mandatory inclusion of a second assessor in the PBA process.

275

276 **Discussion**

277 The aim of this study was to determine practice tutors', clinical educators', practice
278 tutors' and students' preferences towards the development of PBA in physiotherapy
279 education using DCE. The significant contribution made by physiotherapy clinicians in the
280 preparation of physiotherapy students' for independent clinical practice (6-9, 24) and their
281 daily engagement with the PBA process supported their inclusion in this task. The value of
282 DCE methodology lay in its ability to determine the relative importance to these stakeholders,
283 of selected factors related to the development of PBA, namely, issues related to the PBA tool,
284 grading mechanisms, assessors involved and feedback mechanisms determined by preceding
285 focus group interviews (3, 4). While the response rates may have been lower than anticipated
286 for clinical educator and student groups, and therefore demand caution in the generalisability
287 of findings, they are consistent with DCE studies conducted by online survey methods (33),
288 are reflective of the national gender ratio for these cohorts and are substantiated by a
289 comprehensive qualitative phase which preceded and informed this DCE (3, 4). Thus, the
290 robustness of DCE methodology should render it of particular interest to health professional

291 education providers globally, in particular to those seeking to address similar research
292 questions.

293 ***Robustness of PBA process***

294 A clear consensus was apparent in our findings, with all three groups sharing common
295 first and second preferences for the development of PBA. These centred overwhelmingly on
296 the inclusion of two assessors in the PBA process. Currently, routine assessment practice in
297 physiotherapy practice-based education involves one assessor, the clinical educator, assigned
298 to the student for the course of the practice-based module (8, 9). These stakeholder
299 preferences reflect a need for greater transparency and robustness of assessment procedures
300 in the clinical workplace and the need for greater support of trainers involved in training the
301 future physiotherapy workforce. The employment of a second assessor in work-based
302 assessment would help to improve the reliability and trustworthiness of the PBA process, as
303 outlined in our qualitative findings (3, 4) and supported by evidence from other studies (6, 7,
304 25, 26). However, this study goes further indicating that the need for a second assessor may
305 override all other priority areas known to be of value to these stakeholder groups.

306 ***Dedicated educational role***

307 Practice tutors' highest preference was for the involvement of *both* a practice tutor
308 and clinical educator in the PBA process rather than two clinical educators, highlighting the
309 perceived value of a dedicated educational role in the workplace. This was also reflected in
310 the highest preferences of the clinical educator and student group. This has been corroborated
311 in previous studies (3, 4, 8) where the practice tutor role has been lauded for the educational
312 expertise provided to students and clinical educators, the sharing of responsibility in high-
313 stakes decisions regarding students' readiness for practice and the standardisation of PBA
314 procedures on these supported sites. The student group, while indicating a preference for two
315 assessors in the process, showed no significant preference for the composition of these two

316 assessors, although a clear distinction was made regarding this in student focus group
317 interviews preceding the DCE (3). This may have been influenced by the response rate for the
318 student group. Nonetheless, it reflects a similar trend to that seen in the two other groups.
319 Wider implementation of practice tutor roles across the health professions could positively
320 influence decision-making in PBA, providing a mechanism of sharing responsibility for
321 student assessment, which may encourage greater uptake of student supervision among
322 clinical educators and addressing concerns regarding support for clinical educators in the
323 workplace (4, 6, 7). Thus, these roles demand further evaluation in order to explore their
324 potential for greater development of the learning and assessment process in the workplace.

325 *Addressing identified priorities*

326 The need for a second assessor in the PBA process is corroborated in previous studies
327 in physiotherapy (3, 4) and also supported by evidence from medical education which
328 advocates the need for multiple assessors and multiple methods of assessment to provide a
329 comprehensive, reliable picture of student performance (26, 27, 28). Practically, this need
330 may be achieved in the discipline of physiotherapy by employing the split placement model
331 or practice tutor model, where the student is supervised by two educators. As it is not unusual
332 for student supervision to be shared among junior and senior members of the physiotherapy
333 team in the clinical learning environment, this may not require further resources but rather
334 formal acknowledgement of a dual marking process and clear communication between
335 designated assessors (3, 6).

336 While all stakeholder groups called for refinement of the PBA tool (third preference),
337 there was no clear agreement on what this might look like. This may have been due to limited
338 knowledge among stakeholders regarding other options for assessment methods, and limited
339 research in practice-based education in physiotherapy, where the common practice of single
340 assessment tools and single assessors prevails. Notwithstanding, evidence from medical

341 education suggests that absolute agreement among assessors is not wholly essential if
342 multiple perspectives and multiple assessment methods are employed (27, 29-31). Thus,
343 while the findings here related to change in the PBA tool are not conclusive, broader
344 consideration of evidence regarding PBA from other health professions may further inform
345 and priority.

346 ***Limitations***

347 Response rates in our study may have been influenced by the cognitive burden
348 associated with DCE surveys (22, 32) although attempts were made to minimise this through
349 a pilot study conducted in advance of dissemination of the DCE to ensure the clarity and
350 feasibility of the survey. The response rate from the practice tutor group was exceptionally
351 high, likely due to an invested interest in practice-based education and assessment in the
352 workplace. The response rate from clinical educators was lower, but is in line with other
353 online DCE surveys (33). The student response rate was lower than we anticipated and may
354 be explained by the timing of the study, where the survey was disseminated to students close
355 to the end of the academic year. This may have led to a response bias, however, the
356 complexity and rigorous design phases involved in DCE lends itself to a robust process and
357 in this case, our findings are wholly substantiated by findings from the preceding qualitative
358 phase (3, 4).

359 **Conclusion**

360 Our findings provide valuable insight into practice tutors', clinical educators' and
361 students' priorities towards developing the PBA process in practice-based physiotherapy
362 education. These preferences overwhelmingly centre around the involvement of two
363 assessors, highlighting the need for greater transparency and robustness of the PBA process.
364 The employment of DCE methodology provides a stakeholder-centred understanding of the

365 relative importance of factors related to improvement of the PBA process and should be
366 considered by other health professions seeking answers to similar research questions.

367

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378

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Each question will present you with four choices related to hypothetical changes in the student assessment process. These relate to four main areas; 1) assessment tool 2) grading mechanisms 3) assessors 4) feedback mechanism. The aim is to identify what you think would facilitate the best assessment process.

- The criteria used to describe achievement of learning outcomes will be objective and measurable
- Student's clinical performance will be graded using a numerical system e.g. out of 10 or 100
- The clinical educator who supervises the student will be solely responsible for their assessment
- Feedback based on student observation/ case-based discussion will be provided to the student once a week

If **ALL** 4 options above were to be applied to student assessment, would you be satisfied to implement them? Please Tick Yes or No:

YES NO

479 Figure 1. Example of choice set question

480

481 Table 1. PBA attributes and levels

Attribute	Levels
Assessment Tool (PBA Tool*)	<ol style="list-style-type: none"> 1. The criteria used to describe achievement of learning outcomes should be objective and measurable (Criteria*) 2. Clinical reasoning should be the most heavily weighted of all learning outcomes (Clinical reasoning*) 3. The assessment tool should avoid duplication of learning outcomes (Duplication*) 4. Safe practice should be identified as a pass/ fail learning outcome that overrides performance in all other areas (Safety*)
Grading Mechanisms (Grading Mechanism*)	<ol style="list-style-type: none"> 1. Student's clinical performance should be graded using a numerical system e.g. out of 10 or 100 (Numerical*) 2. Student's clinical performance should be graded on a pass/ fail basis (Pass/Fail*) 3. Student's clinical placements should include a combination of numerically graded and pass/fail graded placements (Combination*) 4. Student's clinical performance should be graded using a Global Rating Scale (i.e. Fail/Adequate/Good/Very Good/ Excellent) (Global Rating Scale*)

Assessors involved in PBA (Assessors*)	<ol style="list-style-type: none"> 1. The clinical educator who supervises the student will be solely responsible for their assessment (One CE*) 2. Two clinical educators will be jointly responsible for student assessment (Two CE*) 3. The clinical educator and practice tutor will be jointly responsible for student assessment (PT and CE*) 4. The practice tutor will be solely responsible for student assessment (One PT*)
Feedback Mechanisms (Feedback*)	<ol style="list-style-type: none"> 1. Feedback based on observation of a patient or case-based discussion will be provided once a week (Weekly case-based*) 2. Written feedback on overall performance will be provided once a week (Weekly written*) 3. Verbal feedback on overall performance will be provided once a week (Weekly verbal*) 4. Written feedback on overall performance will be provided at midway and end of placement (Written mid/ end*)

482 * Abbreviations for each attribute and level used later in text

483

484 Table 2. Demographic data and details for all three groups

	Students (N=72)	Clinical Educators (N=124)	Practice Tutors (N=49)
Mean Age (SD)	23 (4)	38 (8)	38 (7)
	%	%	%
Gender			
<i>Male</i>	28%	14%	12%
<i>Female</i>	72%	86%	84%
<i>Prefer not to</i>	0%	0%	4%
<i>say</i>			
Year of education			

Year 1 0%

Year 2 1%

Year 3 46%

Year 4 53%

No. weeks practice education completed

0 to 10 3%

11 to 20 47%

21 to 30 26%

31 and over 24%

No. years qualified as physiotherapist

0-5 4% 10%

6-15 53% 49%

16-25 33% 29%

26 and over 10% 12%

No. years involved in student supervision

0-5 33% 36%

6-15 61% 45%

16-25 6% 16%

26 and over 0% 3%

485 (SD: standard deviation)

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491

492 Table 3. Results from logistic regression model for the three stakeholder groups

		Student		Clinical		Practice	
				Educator		Tutor	
Model Results		(MLE (95% CI))	p value	(MLE (95% CI))	p value	(MLE (95% CI))	p value
PBA Tool	Criteria	1.006	<0.001	1.216	<0.001	0.519	0.070
	(Ref: Clinical Reasoning)	(0.563-1.448)		(0.840-1.592)		(-0.042-1.079)	
Reasoning	Duplication	0.924	<0.001	1.160	<0.001	0.710	0.013
		(0.478-1.370)		(0.787-1.532)		(0.152-1.269)	
	Safety	0.737	0.001	1.063	<0.001	0.612	0.031
		(0.299-1.175)		(0.694-1.431)		(0.056-1.176)	
Grading	Numerical	0.907	<0.001	0.343	0.100	0.210	0.510
Mechanisms		(0.411-1.402)		(-0.066-0.751)		(-0.414-0.833)	
(Ref: Pass/Fail)	Combination	0.770	0.004	0.339	0.126	0.189	0.576
		(0.247-1.294)		(-0.095-0.774)		(-0.472-0.850)	
	Global Rating	0.977	<0.001	-0.124	0.548	-0.033	0.916
	Scale	(0.484-1.471)		(-0.529-0.281)		(-0.652-0.585)	
Assessors	One CE	0.872	<0.001	0.833	<0.001	0.618	0.034
(Ref: One PT)		(0.421-1.323)		(0.458-1.207)		(0.047-1.189)	

	Two CE	1.816 (1.369- 2.264)	<0.001	1.511 (1.147-1.875)	<0.001	1.95 (1.388- 2.513)	<0.001
	PT and CE	1.998 (1.544- 2.452)	<0.001	2.168 (1.786-2.550)	<0.001	2.792 (2.189- 3.395)	<0.001
Feedback Mechanisms (Ref: Weekly written)	Weekly case-based	0.229 (-0.185- 0.645)	0.278	0.136 (-0.209- 0.480)	0.440	0.048 (-0.478- 0.573)	0.859
	Weekly verbal	0.462 (0.041- 0.883)	0.031	0.301 (-0.053- 0.654)	0.095	0.033 (-0.504- 0.571)	0.903
	Written mid/end	0.203 (-0.237- 0.642)	0.366	0.236 (-0.128- 0.600)	0.204	-0.047 (-0.601- 0.507)	0.868
	Constant	1.076 (0.621- 1.531)		1.808 (1.438- 2.178)		1.424 (0.865- 1.982)	
Model statistics							
	Log likelihood	-605.556		-924.440		-389.632	
	No. of participants	72		124		49	
	No. of observations	1129		1917		783	

493 MLE: Maximum Likelihood Estimates (Refer to Table 1 for complete list of attributes and
494 levels. 95%CI = 95% confidence intervals)
495