

1 **The evidence base for interprofessional education within health professions education: A**
2 **protocol for an update systematic review**
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47 **Abstract**

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49 Interprofessional education (IPE) interventions aiming to promote collaborative competence and
50 improve the delivery of health and social care processes and outcomes continue to evolve. This
51 paper reports on a protocol for a systematic review that will identify and understand how the IPE
52 evidence base has evolved in the last 7 years. We will identify literature through a systematic
53 search of the following electronic databases: Medline, Embase, CINAHL, Education Source,
54 Eric, and BEI. We will consider all IPE interventions delivered to health professions students and
55 accredited professionals. Peer-reviewed empirical research studies published in any language
56 from June 2014 onwards will be eligible for inclusion. The outcomes of interest are changes in
57 the reaction, attitudes/perceptions, knowledge/skills acquisition, behaviors, organizational
58 practice, and/or benefits to patients. We will perform each task of screening, critical appraisal,
59 data abstraction and synthesis using at least 2 members of the review team. The review will
60 enable an updated and comprehensive understanding of the IPE evidence base to inform future
61 IPE developments, delivery and evaluation across education and clinical settings.

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64 **Keywords:** Interprofessional education, collaborative, intervention, effectiveness, review
65 protocol
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67 **Introduction**

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69 Two previous comprehensive reviews systematically searched the interprofessional education
70 (IPE) literature up to June 2014, identifying a total of 46 high-quality studies (Hammick et al.,
71 2007; Reeves et al., 2016). These reviews have been key to informing ongoing development of
72 IPE initiatives and policies internationally, cited by international bodies including the World
73 Health Organization and the World Bank (Altmetric, n.d.). Echoing the conclusions of the 2007
74 review (Hammick et al., 2007), Reeves and colleague's 2016 update found that central issues
75 concerning the context of the organization in which IPE was implemented, as well as the
76 characteristics of participants and IPE teaching and learning processes, continued to resonate in
77 the delivery of IPE. Learners still had positive reactions to IPE, with evidence of improvements
78 in attitudes and collaborative competence (Reeves et al., 2016); however, as also noted by the
79 initial review, there remained sparse evidence on changes in learners' behavior, organizational
80 practice, and benefits to service users (Hammick et al., 2007; Reeves et al., 2016).

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82 We report on a protocol for a systematic review updating the previous reviews by Hammick et
83 al. (2007) and Reeves et al. (2016), which aims to describe and understand how the IPE evidence
84 base has evolved in the intervening period. The specific objective of our update review is to
85 consider the effectiveness of different types of IPE interventions on a range of outcomes. These
86 outcomes include impact on the modification of learner attitudes and perceptions, acquisition of
87 knowledge and skills, and subsequent change in organizational practice and/or benefits to
88 patients/clients. We expect that the updated review will encourage and inform curriculum
89 planners in designing future IPE interventions. We also expect that the updated review will help
90 policy makers, researchers and grant funders to discern priorities for development in this field.

91

92 **Background**

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94 Since the publication of the two previous reviews, the IPE field has continued to grow
95 internationally and this is reflected in the increasing number of publications and regular
96 international conferences (Bulcke et al., 2016; Cardarelli et al., 2018; Collins et al., 2017; Djukic
97 et al., 2015; *Interprofessional Practice and Education Center*, 2021; Naumann et al., 2020). Our
98 review update is therefore timely given the continued interest and investment in IPE by
99 researchers, educators, practitioners, and policymakers. Despite this positive trend, the evidence
100 base continues to show signs of fragmentation, which introduces uncertainty about the direction
101 and magnitude of the effects of IPE (Reeves et al., 2013).

102

103 IPE refers to ‘occasions when two or more health/social care professions learn with, from and
104 about each other to improve collaboration and the quality of care’ (Barr et al., 2005). It is a
105 specific kind of educational intervention, uptake of which is evident worldwide with a view to
106 strengthening the collaborative capacity and practice of health professionals (Barr et al., 2005;
107 Kitto, Chesters, et al., 2011). Moreover, through consequent improvements in the efficiency and
108 quality of clinical practice, IPE is also regarded as having potential to improve the safety and
109 quality of patient care (Reeves et al., 2011).

110

111 Over recent years, IPE has been a key feature of pre- and post-qualification health and social
112 care education (Bulcke et al., 2016; Naumann et al., 2020), as well as of continuing professional
113 education offering to qualified clinicians (Cardarelli et al., 2018). While it is generally
114 understood that IPE has strong potential to improve learners’ collaborative attitudes, knowledge,

115 skills and behaviors, it remains a relatively young field with a rapidly growing evidence base
116 (Collins et al., 2017; Djukic et al., 2015; Naumann et al., 2020). Our update review is
117 particularly interested in assessing whether impacts at higher level outcome measures, such as
118 clinical behavior, patient and organizational outcomes, have been evidenced over the last 7 years.

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121 **Methods**

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123 This paper reports on a protocol of a systematic review in accordance with the reporting

124 guidance provided by the Preferred Reporting Items for Systematic Review and Meta-Analysis

125 Protocols (PRISMA-P) criteria (Moher et al., 2015).

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128 *Inclusion and Exclusion Criteria*

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130 *Types of Participants*

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132 We will include study interventions that target the following professional health, social care

133 groups: chiropodist/podiatrist, complementary therapists, dentists, dieticians, doctors, hygienists,

134 managers, midwives, nurses, occupational therapists, paramedics, pharmacists, physician

135 associates, psychologists, psychotherapists, physiotherapists, radiographers, social workers,

136 speech therapists, sports and exercise medicine professionals, assistant practitioners, care or case

137 coordinators, and managers. The studies may evaluate IPE delivered to undergraduate health

138 professions students, IPE to postgraduate students, IPE at the in-service continuing professional

139 development (CPD) level, or IPE to a mixture of learners such as pre-qualification students and

140 qualified staff.

141

142 *Types of Intervention*

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144 An IPE intervention will be defined as: when members of more than one health and/or social
145 care profession learn interactively together, for the explicit purpose of improving the health or
146 well-being of patients/clients (Reeves et al., 2013). Interactive learning requires active learner
147 participation, and active exchange between learners from different professions. We will consider
148 all designs of IPE interventions for our review as long as they are within the scope of the above
149 definition.

150
151 *Types of Comparison*

152 If a comparison group is included, we will include studies that compare other forms of IPE or
153 other learning against the intervention.

154
155 *Types of Outcome Measures*

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157 The outcome measures will be based on Barr and colleagues' extended version of Kirkpatrick's
158 classic educational outcomes model: Level 1 – Reaction; Level 2a – Modification of
159 attitudes/perceptions; Level 2b – Acquisition of knowledge/skills; Level 3 – Behavioral changes;
160 Level 4a – Change in organizational practice; Level 4b – Benefits to patients/clients (Barr et al.,
161 2005).

162
163 *Types of Studies*

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165 We will consider all research designs (applied, evaluation, basic and participatory action
166 research) (Patton, 2014), i.e., experimental studies, quasi-experimental studies, action research,
167 case study, and ethnographic studies, published in the peer-reviewed literature. We will not
168 include studies that have already been analyzed in the previous reviews (Hammick et al., 2007;
169 Reeves et al., 2016) in the updated search. However, these studies will be combined at the
170 analysis phase.

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Information Sources and Searching

Our review will search the following electronic databases for publications from June 2014 onwards to update the latest review: Medline and Embase on the OVID platform; CINAHL, ERIC, Education Source, and BEI on the EBSCO platform. The search strategies for the databases are included in Appendix 1. Due to variations in how each of the electronic databases employ key terms (subject headings, key words), the search strategy for Ovid MEDLINE has been adapted for each electronic database. In addition to database searching, we will conduct hand searches of leading interprofessional journals, such as the Journal of Interprofessional Care. We will also perform a manual search of the reference lists of the relevant articles to consider additional studies for potential inclusion.

Screening and Selection Process

We will import all the database search results into Covidence (Veritas Health Innovation Ltd.), where duplicate records will be removed. In the first level of screening, at least two PhD level screeners will independently screen all titles and abstracts. The full text article will be obtained if the abstract suggests the following: 1) the intervention resulted in interprofessional exchange; 2) learning took place; 3) learner, professional practice, change in organizational practice, patient care processes or health and satisfaction outcomes are reported; 4) the intervention was evaluated using an appropriate design. In the second level of screening, at least two senior members of the review team will independently screen the full text of articles deemed relevant from first level of screening, to determine eligibility. We will not exclude papers based on language of publication. We will use professional translation software and/or translators to translate non-English

198 documents to English, when necessary. All conflicts from level 1 screening will be resolved by
199 AWF, while all conflicts from level 2 screening will be resolved by SK or AX.

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202 *Quality Assessment*

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204 Two dyads (4 reviewers working in independent pairs) will assess the methodological quality of
205 each of the studies that pass the second level of screening. For the purposes of advancement and
206 transparency, we will employ a new tool to perform the quality appraisals in this review and
207 future update reviews. In particular, we will assess the quality of each study using the Mixed
208 Methods Appraisal Tool (MMAT) – V.2018 (Hong et al., 2018). The MMAT is designed for
209 systematic reviews that include various study designs (Hong et al., 2019). It contains specific
210 criteria to assess the quality of qualitative research, quantitative (subdivided into randomized-
211 controlled trials, non-randomized studies, and descriptive studies), and mixed-methods studies
212 (e.g. sequential explanatory design). The ability to concurrently appraise the various study
213 designs using a single tool will improve the efficiency and consistency of our appraisal process
214 (Hong et al., 2019; Pluye, 2015).

215

216 For all study designs, only articles categorized as high quality will be selected for data
217 abstraction, analysis and synthesis. The use of this approach will aim to identify the most
218 rigorous IPE studies available. The MMAT V. 2018 includes five separate questions for each
219 category of study designs [See Appendix 2]. These questions will be answered with ‘Yes,’ (1
220 point) ‘No’ (0 points) or Can’t tell’ (0.5 points). Studies that receive a score of at least 4/5 will be
221 categorized as high-quality and included in the review. Any disagreements during appraisal will

222 be settled through discussion. In the absence of consensus, disagreements will be reviewed and
223 resolved by SK or AX.

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226 *Abstraction of Included Studies*

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228 We will extract the general characteristics, methodological information, and outcome
229 information of the high-quality papers included in our review. Following the abstraction
230 procedure described in the previous reviews, our data extraction process aims to generate basic
231 descriptive information from each paper. Data from the included studies will either be abstracted
232 into one of the two coding sheets employed in the previous review (Reeves et al., 2016) [see data
233 abstraction sheets – Appendix 3 and 4]. We will use the abstracted data as the basis for analysis.

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235 The Quantitative Data Abstraction sheet will be used where studies have used quantitative
236 methods of data collection [see Appendix 3]. The Qualitative Data Abstraction sheet will be used
237 where studies have used qualitative methods of data collection [see Appendix 4]. For mixed-
238 method studies, we will use the Quantitative Abstraction sheet to extract the quantitative
239 components, and the Qualitative Abstraction sheet to extract the qualitative components. These
240 coding sheets will help to ensure consistency across the qualitative and quantitative data
241 collection methods and reflect the unique features of their approaches. At least 2 members of the
242 review team will independently code a 20% sample of the full-texts into the appropriate
243 abstraction sheets to ensure consistency and reliability between the reviewers. Discrepancies and
244 disputes will be resolved through discussion. In the absence of consensus, disagreements will be
245 reviewed and resolved by SK or AX.

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247 *Analysis and Synthesis*

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249 Experience from the previous reviews (Hammick et al., 2007; Reeves et al., 2016) indicates that
250 very few of the variables used in the papers will be ratio data, some will be interval data, and
251 others will be categorical data. This means that a standard multivariate analysis will not be
252 possible, therefore we expect to employ non-parametric methods for the analysis. Due to the
253 heterogeneity of IPE interventions identified in the previous reviews (different curriculum
254 content, duration of courses, participating professional groups) and study designs (quasi-
255 experimental, exploratory, action-orientated), we speculate that a pooled estimate of the impact
256 of IPE through a meta-analysis will not be possible. The nature of education research in this field
257 also makes a meta-analysis unlikely. Therefore, the studies identified from the updated search
258 will be added to the existing 46 studies to form a single narrative of all included studies.

259
260 The previous reviews employed Biggs' presage-process-product (3P) model of learning and
261 teaching to help understand IPE research in relation to contextual factors, educational processes
262 and associated outcomes (Biggs, 1993). We will similarly employ the 3P model as an analytical
263 framework to synthesize the abstracted data from all the included studies. At least two members
264 of the review team will independently distill issues from the papers that can be mapped onto the
265 3-P model. This work will involve populating the presage, process, product sections with
266 extracted points. A draft narrative will be produced based on this work. We will discuss and
267 refine the synthesized narrative of the included studies linking IPE presage with IPE processes
268 and products. For further details on the use of the 3P model in our previous review, see Reeves et
269 al. (2016).

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271 **Discussion**

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273 A key contribution of updating the previous reviews will be to synthesize the best, current
274 available evidence to inform future IPE developments, delivery and evaluation across education
275 and clinical settings. We also expect that this update will inform other IPE stakeholders
276 including managers, policy makers and practitioners, of the effects of various IPE initiatives on
277 longer-term outcomes, including service delivery and patient care.

278 We anticipate three key limitations to our review: 1) the inability to complete a meta-analysis
279 due to the known heterogeneity of IPE interventions; 2) we acknowledge that the exclusion of
280 non-English or French language articles in the previous reviews may have omitted some high-
281 quality studies published in other languages. Our intention is to be more inclusive in this review
282 and in future updates; and 3) we also acknowledge the possibility of positive publication bias in
283 the IPE literature, as well as the dominance of Western research in biomedical databases. These
284 risks are recognized in the health sciences literature (Ayorinde et al., 2020; Joobar et al., 2012),
285 including the knowledge translation field (Kitto, Sargeant, et al., 2011); however, these issues
286 have not been appropriately acknowledged in the IPE field. To ameliorate these risks, we have
287 put together a diverse, and highly experienced project team from multiple institutions. Other
288 strategies to improve the rigor and ameliorate potential risks in this review include adherence to
289 a reporting guideline, comprehensive searching of the literature, and the planned use of multiple
290 review members for each stage of the review.

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293 **Concluding comments**

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295 The proposed review aims to provide up-to-date evidence of the effectiveness of IPE

296 interventions on collaborative competence and the delivery of health and social care processes

297 and outcomes. In updating the findings from two previous reviews, our review will help inform
298 curriculum developers and educators about the utility of different IPE interventions delivered in
299 various contexts.

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303 **Declaration of interest**

304 The authors declare that they have no conflicts of interest. The authors alone are responsible for
305 the content and writing of this short report.

306

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308

309 None

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312 **Contributions**

313

314 SK, AWF and AX designed and drafted this short report protocol manuscript. ND, AM, JR, IB,

315 SF, and HB contributed to the conceptualization and design of the previous review. KF

316 developed the search strategies for this short report protocol manuscript. ND, AM, JR, and IB

317 reviewed and provided critical comments on the short report. AWF, SK and AX revised the short

318 report based on the critical comments. All authors read and approved this final manuscript.

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Appendix 1: Search Strategy

MEDLINE(R) ALL <1946 to November 22, 2021>		
#	Searches	Results
1	interprofessional education/	189
2	((interprofession* or inter profession* or interdisciplin* or inter disciplin* or interoccupation* or inter occupation* or inter institution* or inter institution* or interagen* or inter agen* or intersector* or inter sector* or interdepartment* or inter department* or interorgani?ation* or inter organi?ation*) adj3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) adj1 develop*))).ti,ab,kf.	5830
3	((multiprofession* or multi profession* or multidisciplin* or multi disciplin* or multiagenc* or multi agenc* or multisector or multi sector or multiorgani?ation* or multi organi?ation* or multiinstitut* or multi institut*) adj3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) adj1 develop*))).ti,ab,kf.	3392
4	((transprofession* or trans profession* or transdisciplin* or trans-disciplin*) adj3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) adj1 develop*))).ti,ab,kf.	146
5	((interprofession* or inter profession* or interdisciplin* or inter disciplin* or interoccupation* or inter occupation* or multiprofession* or multi profession* or multidisciplin* or multi disciplin* or transprofession* or trans profession* or transdisciplin* or trans-disciplin*) and (educat* or training or teach* or simulation* or student* or (team* adj2 intervention*) or ((workplace* or continu* or staff or employee*) adj1 develop*))).ti.	4094
6	(IPE or crosstrain* or cross train*).ti.	279
7	or/1-6	9973
8	(comment or letter or editorial).pt.	2014608
9	7 not 8	9653
10	limit 9 to yr="2014 -Current"	6249
11	(201401* or 201402* or 201403* or 201404* or 201405*).dt,ed.	765884
12	10 not 11	6040

Embase <1974 to 2021 November 22>		
#	Searches	Results
1	interprofessional education/	396
2	((interprofession* or inter profession* or interdisciplin* or inter disciplin* or interoccupation* or inter occupation* or inter institution* or inter institution* or interagen* or inter agen* or intersector* or inter sector* or interdepartment* or inter	7362

	department* or interorgani?ation* or inter organi?ation*) adj3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) adj1 develop*))).ti,ab,kw.	
3	((multiprofession* or multi profession* or multidisciplin* or multi disciplin* or multiagenc* or multi agenc* or multisector or multi sector or multiorgani?ation* or multi organi?ation* or multiinstitut* or multi institut*) adj3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) adj1 develop*))).ti,ab,kw.	6306
4	((transprofession* or trans profession* or transdisciplin* or trans-disciplin*) adj3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) adj1 develop*))).ti,ab,kw.	173
5	((interprofession* or inter profession* or interdisciplin* or inter disciplin* or interoccupation* or inter occupation* or multiprofession* or multi profession* or multidisciplin* or multi disciplin* or transprofession* or trans profession* or transdisciplin* or trans-disciplin*) and (educat* or training or teach* or simulation* or student* or (team* adj2 intervention*) or ((workplace* or continu* or staff or employee*) adj1 develop*))).ti.	5498
6	(IPE or crosstrain* or cross train*).ti.	368
7	or/1-6	14724
8	(letter or editorial or conference abstract).pt.	6159191
9	abstract report/ or letter/	1217438
10	or/8-9	6254004
11	7 not 10	9949
12	limit 11 to yr="2014 -Current"	5950
13	(201401* or 201402* or 201403* or 201404* or 201405*).dd,dc.	676362
14	12 not 13	5875

ERIC <1965 to May 2021>		
#	Searches	Results
1	((interprofession* or inter profession* or interdisciplin* or inter disciplin* or interoccupation* or inter occupation* or inter institution* or inter institution* or interagen* or inter agen* or intersector* or inter sector* or interdepartment* or inter department* or interorgani?ation* or inter organi?ation*) adj3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) adj1 develop*))).tw.	901
2	((multiprofession* or multi profession* or multidisciplin* or multi disciplin* or multiagenc* or multi agenc* or multisector or multi sector or multiorgani?ation* or multi organi?ation* or multiinstitut* or multi institut*) adj3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) adj1 develop*))).tw.	1164

3	((transprofession* or trans profession* or transdisciplin* or trans-disciplin*) adj3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) adj1 develop*))).tw.	228
4	((interprofession* or inter profession* or interdisciplin* or inter disciplin* or interoccupation* or inter occupation* or multiprofession* or multi profession* or multidisciplin* or multi disciplin* or transprofession* or trans profession* or transdisciplin* or trans-disciplin*) and (educat* or training or teach* or simulation* or student* or (team* adj2 intervention*) or ((workplace* or continu* or staff or employee*) adj1 develop*))).ti.	707
5	(IPE or crosstrain* or cross train*).ti.	30
6	or/1-5	2530
7	limit 6 to yr="2014 -Current"	732
8	(book* or creative works or opinion papers).pt.	191948
9	7 not 8	708

CINAHL (EBSCOHost)

#	Query	Limiters/Expanders	Results
S12	S10 NOT S11	Limiters - Peer Reviewed; Published Date: 20140601-20211231 Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	6,136
S11	(ZT "bibliography") or (ZT "biography") or (ZT "book") or (ZT "book chapter") or (ZT "book review") or (ZT "commentary") or (ZT "editorial") or (ZT "historical material") or (ZT "letter") or (ZT "letter to the editor") or (ZT "newspaper") or (ZT "opinion")	Limiters - Peer Reviewed; Published Date: 20140601-20211231 Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	302,314
S10	S1 OR S2 OR S3 OR S4 OR S5 OR S6	Limiters - Peer Reviewed; Published Date: 20140601-20211231 Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	6,495

S9	S1 OR S2 OR S3 OR S4 OR S5 OR S6	Limiters - Peer Reviewed; Published Date: 20140101-20221231 Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	6,786
S8	S1 OR S2 OR S3 OR S4 OR S5 OR S6	Limiters - Published Date: 20140101- 20221231 Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	7,242
S7	S1 OR S2 OR S3 OR S4 OR S5 OR S6	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	13,099
S6	TI (IPE or crosstrain* or "cross train*")	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	346
S5	TI ((interprofession* or "inter profession*" or interdisciplin* or "inter disciplin*" or interoccupation* or "inter occupation*" or multiprofession* or "multi profession*" or multidisciplin* or "multi disciplin*" or transprofession* or "trans profession*" or transdisciplin* or "trans-disciplin*") and (educat* or training or teach* or simulation* or student* or (team* N2 intervention*) or ((workplace* or continu* or staff or employee*) N1 develop*))	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	4,744
S4	TI (((transprofession* or "trans profession*" or transdisciplin* or "trans-disciplin*") N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*))) OR AB (((transprofession* or "trans profession*" or transdisciplin* or "trans-disciplin*") N3 (student* or	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	120

	educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))		
S3	TI (((multiprofession* or “multi profession”* or multidisciplin* or “multi disciplin*” or multiagenc* or “multi agenc*” or multisector or “multi sector” or multiorgani?ation* or “multi organi?ation*” or multiinstitut* or “multi institut*”) N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*))) OR AB (((multiprofession* or “multi profession”* or multidisciplin* or “multi disciplin*” or multiagenc* or “multi agenc*” or multisector or “multi sector” or multiorgani?ation* or “multi organi?ation*” or multiinstitut* or “multi institut*”) N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	2,550
S2	TI (((interprofession* or “inter profession”* or interdisciplin* or “inter disciplin*” or interoccupation* or “inter occupation*” or “inter institution*” or “inter institution*” or interagen* or “inter agen*” or intersector* or “inter sector*” or interdepartment* or “inter department*” or interorgani?ation* or “inter organi?ation*”) N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*))) OR AB (((interprofession* or “inter profession”* or interdisciplin* or “inter disciplin*” or interoccupation* or “inter occupation*” or “inter institution*” or “inter institution*” or interagen* or “inter agen*” or intersector* or “inter sector*” or interdepartment* or “inter department*” or interorgani?ation* or “inter organi?ation*”) N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	7,246

S1	(MH "Education, Interdisciplinary")	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	6,264
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Education Source (EBSCOHost)		
#	Query	Results
S1	DE "Interprofessional education"	941
S2	TI (((interprofession* or "inter profession*" or interdisciplin* or "inter disciplin*" or interoccupation* or "inter occupation*" or "inter institution*" or "inter institution*" or interagen* or "inter agen*" or intersector* or "inter sector*" or interdepartment* or "inter department*" or interorgani?ation* or "inter organi?ation*") N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))) OR AB (((interprofession* or "inter profession*" or interdisciplin* or "inter disciplin*" or interoccupation* or "inter occupation*" or "inter institution*" or "inter institution*" or interagen* or "inter agen*" or intersector* or "inter sector*" or interdepartment* or "inter department*" or interorgani?ation* or "inter organi?ation*") N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*))))	7,358
S3	TI (((multiprofession* or "multi profession*" or multidisciplin* or "multi disciplin*" or multiagenc* or "multi agenc*" or multisector or "multi sector" or multiorgani?ation* or "multi organi?ation*" or multiinstitut* or "multi institut*") N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))) OR AB (((multiprofession* or "multi profession*" or multidisciplin* or "multi disciplin*" or multiagenc* or "multi agenc*" or multisector or "multi sector" or multiorgani?ation* or "multi organi?ation*" or multiinstitut* or "multi institut*") N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*))))	1,626
S4	TI (((transprofession* or "trans profession*" or transdisciplin* or "trans-disciplin*") N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))) OR AB (((transprofession* or "trans profession*" or transdisciplin* or "trans-disciplin*") N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement*	346

	or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))	
S5	TI ((interprofession* or “inter profession*” or interdisciplin* or “inter disciplin*” or interoccupation* or “inter occupation*” or multiprofession* or “multi profession*” or multidisciplin* or “multi disciplin*” or transprofession* or “trans profession*” or transdisciplin* or “trans-disciplin*”) and (educat* or training or teach* or simulation* or student* or (team* N2 intervention*) or ((workplace* or continu* or staff or employee*) N1 develop*))	3,322
S6	TI (IPE or crosstrain* or "cross train*")	88
S7	S1 OR S2 OR S3 OR S4 OR S5 OR S6	10,026
S8	S1 OR S2 OR S3 OR S4 OR S5 OR S6 Limiters - Peer Reviewed; Published Date: 20140601-20211231	3,960
S9	(PZ "book") or (PZ "book chapter") or (PZ "newspaper") or (PZ "editorial") or (PZ "letter") or (PZ "opinion")	147,850
S10	S8 NOT S9	3,908

BEI (EBSCOHost) > December 17th, 2021			
#	Query	Limiters/Expanders	Results
S8	S1 OR S2 OR S3 OR S4 OR S5 OR S6	Limiters - Scholarly (Peer Reviewed) Journals; Publication Date: 20140601-20211231 Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	976
S7	S1 OR S2 OR S3 OR S4 OR S5 OR S6	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	1,533
S6	TI (IPE or crosstrain* or "cross train*")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	4
S5	TI ((interprofession* or “inter profession*” or interdisciplin* or “inter disciplin*” or interoccupation* or “inter occupation*” or multiprofession* or “multi profession*” or multidisciplin* or “multi disciplin*” or transprofession* or “trans profession*” or transdisciplin* or “trans-disciplin*”) and (educat* or training or teach* or simulation* or student* or (team* N2 intervention*) or	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	599

	((workplace* or continu* or staff or employee*) N1 develop*))		
S4	TI (((transprofession* or “trans profession*” or transdisciplin* or “trans-disciplin*”) N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*))) OR AB (((transprofession* or “trans profession*” or transdisciplin* or “trans-disciplin*”) N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	55
S3	TI (((multiprofession* or “multi profession*” or multidisciplin* or “multi disciplin*”) or multiagenc* or “multi agenc*” or multisector or “multi sector” or multiorgani?ation* or “multi organi?ation*” or multiinstitut* or “multi institut*”) N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*))) OR AB (((multiprofession* or “multi profession*” or multidisciplin* or “multi disciplin*”) or multiagenc* or “multi agenc*” or multisector or “multi sector” or multiorgani?ation* or “multi organi?ation*” or multiinstitut* or “multi institut*”) N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	239
S2	TI (((interprofession* or “inter profession*” or interdisciplin* or “inter disciplin*”) or interoccupation* or “inter occupation*” or “inter institution*” or “inter institution*” or interagen* or “inter agen*” or intersector* or “inter sector*” or interdepartment* or “inter department*” or interorgani?ation* or “inter organi?ation*”) N3 (student* or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*))) OR AB (((interprofession* or “inter profession*” or interdisciplin* or “inter disciplin*”) or interoccupation* or “inter occupation*” or “inter institution*” or “inter institution*” or interagen* or “inter agen*” or intersector* or “inter sector*” or interdepartment* or “inter department*” or interorgani?ation* or “inter organi?ation*”) N3 (student*	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	848

	or educat* or train* or teach* or learn* or course* or class or classes or placement* or simulation* or workshop* or ((workplace* or continu* or staff or employee*) N1 develop*)))		
S1	DE "INTERDISCIPLINARY education"	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	550

Note

- The electronic search of the databases identified 23,643 citations. 10,550 duplicate records were removed using Covidence (Veritas Health Information, Melbourne, Australia), which left 13,093 references for the first screening phase.

Appendix 2: Mixed Methods Appraisal Tool – Version 2018

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Can't tell	Comments
1. Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1.2. Are the qualitative data collection methods adequate to address the research question?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1.3. Are the findings adequately derived from the data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1.4. Is the interpretation of results sufficiently substantiated by data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Quantitative randomized controlled trials	2.1. Is randomization appropriately performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	2.2. Are the groups comparable at baseline?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	2.3. Are there complete outcome data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	2.4. Are outcome assessors blinded to the intervention provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	2.5. Did the participants adhere to the assigned intervention?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Quantitative nonrandomized	3.1. Are the participants representative of the target population?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	3.3. Are there complete outcome data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	3.4. Are the confounders accounted for in the design and analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the research question?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	4.2. Is the sample representative of the target population?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	4.3. Are the measurements appropriate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	4.4. Is the risk of nonresponse bias low?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	4.5. Is the statistical analysis appropriate to answer the research question?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Mixed methods	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	5.2. Are the different components of the study effectively integrated to answer the research question?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	5.5. Do the different components of the study adhere to the quality criteria	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	of each tradition of the methods involved?				
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Appendix 3: Quantitative Data Abstraction Sheet (with explanatory notes)

CRITERIA	COMMENTS
Ref. No:	
Citation	
Type	State whether paper has been obtained from a journal

EDUCATIONAL INITIATIVE	
Aim/objective of IPE	State aims/objectives (e.g., collaboration; quality of care; flexible workforce; economies of scale or unspecified). Also note if aims/objectives are explicit or implicit
Type of IPE	e.g., formal, informal, or a mixture of both
Content	e.g., common, collaborative, or a mixture. See note 1
Duration	Months, Days, hours ...
Method of learning/teaching	State all methods used, e.g. Received (didactic); Exchange based (participatory); Observation (site visits); Action based (problem-solving); Simulation (role playing); Practice based (placements); Audit; Guideline develop/implement (this last method used widely in Total Quality Management/Continuous Quality Improvement) N.B. Need to be clear in differentiating between 'Problem-Based Learning' as an educational approach and 'problem-solving' as a learning/teaching method
Learning outcomes	Include details on all learning outcomes stated
Location	Workplace, college, hospital / clinic / community / urban / rural Also country of origin (US, UK, and so on)
Participants (number & type)	e.g., social workers, health care managers...community workers...doctors... etc State number from each professional group
Sector	Which broad area of health/social care (e.g. acute, community)
Level / stage	Undergraduate / graduate / in service
Qualification	e.g., whether certificate or not / validation / accreditation

Context	e.g., triggers for IPE; helps & hindrances (description of any 'interesting' contextual details). Also following Harden (1998) could include: characteristics of students, topic covered and 'learning situation'. Also add any contextual information on lesson plans, resources needed, available specific resources (e.g. weblinks to materials)
Rationale for IPE	State conceptual/theoretical underpinning of the IPE (e.g., androgogy, Total Quality Management, Continuous Quality Improvement, audit). Also state whether rationale implicit or explicit (N.B. only classify as explicit where specific theory identified).

OUTCOMES	
Explicit/implicit	Are they implicit or explicit?
Level 1 - Reaction	See note 2
Level 2 – Learning (attitudes/perceptions, acquisition of skills/knowledge)	See note 2
Level 3 - Behavior	See note 2
Level 4a - Practice	See note 2
Level 4b - Patients/clients	See note 2

Other/unspecified	State any other outcomes, or if outcomes are unspecified
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METHODS OF EVALUATION	
Aim of Evaluation (Implicit/explicit)	What are the evaluation aim(s)? (Also state whether aims of evaluation implicitly or explicitly stated)
Research Design	Specify design: Randomized controlled trial, Controlled clinical trial, Controlled before after study, Interrupted time series, Non-Controlled before after, action research, longitudinal, contemporaneous, retrospective – specify when, post-IPE
Data collection method	SPECIFIC TYPES - Interviews, questionnaires, other measures – observation, patient outcomes
Source of data	Whether from students, patients, course organizers/author's description
Data analysis method	Qualitative, quantitative – detail of type
Ethics	Have the relevant ethical issues been discussed (e.g. ethical approval obtained)? Provide details
Relevance	In terms of contributing new insights? Suggesting further research? impacting on policy/practice?

Number of groups (in study)	How many arms in study - e.g. 1 intervention, 2 controls
Unit of study	(1,2 or more levels) i.e., individuals as students or professionals and/or clusters of subjects- e.g., organizations, classes/groups of students or professionals
Method of allocation	Describe how subjects allocated to group.
Allocation concealment	Judge if the study was designed in such a way that the researchers could not bias which subjects went into the intervention group, or the other group Score adequate (A), unclear (B), inadequate (C) or not used (D).
Blinding	Judge if subjects and evaluators unaware of which subjects got intervention Score adequate (A), unclear (B), inadequate (C) or not used (D).
Power calculation	Was there a calculation made of how big the study needed to be to detect the expected difference?
(Original) Sample size	How many participants in each group? (may be at two levels) e.g.: number of classes, number of students
Loss to follow up	How many dropouts from each group
Significance measures	The mean and the standard deviation, confidence interval for the mean difference, test statistic (t test, F test, chi-square test, etc.) or a p-value
Reported biases	These include selection bias, performance bias, attrition bias and detection bias- leave them for now, unless the authors mention a potential bias or confounder.

Note 1 - Content of IPE

Three categories of IPE:

- Common (where all students/groups learn the same content)
- Collaborative (where students/groups learn about one another in order to collaborate)
- Mixed (where students/groups receive a mixture of above two)

Note 2 - Educational Outcomes

Based on Barr et al. (2005) expanded Kirkpatrick outcomes typology:

Level 1 – Reaction: These cover learners’ views on the learning experience, its organization, presentation, content, teaching methods and aspects of the institutional organization. For example, timetabling, materials, quality of teachers. The second element here is concerned with changes to attitudes to IPE as a result of the event.

Level 2 – Learning: These will cover changes in knowledge, skills, competencies and attitudes. Interest here is those aspects that relate to interprofessional work and collaboration. Thus, one could concentrate on acquisition of:

- a. *Modification of attitudes/perceptions* – These outcomes relate to changes in reciprocal attitudes or perceptions between participant groups, towards patients/clients and their condition, other professionals, collaborative work, circumstances, care and treatment.
- b. *Acquisition of knowledge* of facts, concepts, procedures and principles (of work/ skills/ ethics of other professional groups, of group work issues and problems in collaboration). *Acquisition of skills & competencies* refers to thinking and problem solving (as these relate to collaboration in group tasks), psychomotor (collaboration – specific tasks e.g. minor surgery), social (group leader's skills, ability to work in groups, emotional and educational support of other professionals).

Level 3 - Behavioral change: this measurement will document transfer of learning to workplace. This is inevitably more complex as other factors intervene, such as support for change of behavior in the workplace or willingness of learners to apply new knowledge and skills. Further difficulties in ascribing changes of behavior due to learning can be other influences such as changes in legislation or procedures or changes in behavior of other team members. At this level, evaluation will need to observe changes in collaborative practices, application of interprofessional skills and competencies and demonstration of altered interprofessional attitudes.

Level 4a - Changes in organization practice: Structure and process of organization of care, health outcomes (more long-term). This is the most difficult area to show differences as an impact of one professional’s changes in behavior depend on a number of organizational constraints such as individual’s freedom of action, position of responsibility in organization and support for innovation within the organization. In case of whole team undertaking a learning experience this level becomes a legitimate area for investigation especially if specific tasks and responsibilities of the team are clearly differentiated within the larger organization. As such, this level relates to wider changes in the organization/delivery of care, attributable to an education programme, such as interprofessional collaboration and communication, teamwork and co-operative practice, costs to the health and/or social care service.

Level 4b – Benefits to patients/clients: This final level covers any improvements in the health and well-being of patients/clients as a direct result

of an education programme. Where possible objectively measured or self-reported patient/client outcomes will be used, such as: health status measures, disease incidence, duration or cure rates, mortality, complication rates, readmission rates, adherence rates, patient or family satisfaction, continuity of care, costs to caretaker or patient/client.

Appendix 4: Qualitative Data Abstraction Sheet (with explanatory notes)

CRITERIA	COMMENTS
Ref. No:	
Citation Type (jnl, grey lit)	State whether paper has been obtained from a journal/grey literature

EDUCATIONAL INITIATIVE	
Aim/objective of IPE	State aims/objectives (e.g. collaboration; quality of care; flexible workforce; economies of scale or Unspecified). (Also note if aims/objectives are explicit or implicit)
Type of IPE	e.g. formal, informal, or a mixture of both
Content	e.g. common, collaborative, or a mixture - See Note 1
Duration	Months, Days, hours ...
Method of learning/teaching	State all methods used, e.g. Received (didactic); Exchange based (participatory); Observation (site visits); Action based (problem-solving); Simulation (role playing); Practice based (placements); Audit; Guideline develop/implement (this last method used widely in Total Quality Management/Continuous Quality Improvement) N.B. Need to be clear in differentiating between 'Problem-based Learning' as an educational approach and 'problem-solving' as a leaning/teaching method
Learning outcomes	Include details on all learning outcomes stated
Location	Workplace, college, hospital / clinic / community / urban / rural Also country of origin (US, UK, etc)
Participants (number & type)	e.g. social workers, health care managers...community workers...doctors... etc State number from each professional group
Sector	Which broad area of health/social care (e.g. acute, community)
Level / stage	Undergraduate / graduate / in service
Qualification	e.g. whether certificate or not / validation / accreditation
IPE Context	e.g. triggers for IPE; helps & hindrances (description of any 'interesting' contextual details). Also following Harden (1998) could include: characteristics of students, topic covered and 'learning situation'
Rationale for IPE	State conceptual/theoretical underpinning of the study (e.g. androgogy, Total Quality Management, Continuous Quality Improvement, audit). Also state whether rationale implicit or explicit (N.B. only classify as explicit where specific theory identified). Also add any contextual information on lesson plans, resources needed, available specific resources (e.g. weblinks to materials)

OUTCOMES	
Explicit/implicit	Are they implicit or explicit?
Level 1: Reaction	See note 2
Level 2a: Attitudes/perceptions	See note 2
Level 2b: Knowledge/ Skills	See note 2
Level 3: behavior	See note 2

Level 4a: Practice	See note 2
Level 4b: Patients	See note 2
Other/unspecified	State any other outcomes, or if outcomes are unspecified

METHODS OF EVALUATION	
Aim of Evaluation	What are the evaluation aim(s)? Are aims implicitly or explicitly stated?
Sampling	How was the 'sample' obtained? Size? Justification? Saturation of data? Appropriate to address research aim(s)?
Data collection	Observations, semi-structured interviews, focus groups, etc? Research setting/context? How data recorded? Data collection modified during research? Data collection address research aim(s)?
Data analysis	How was data analyzed? (e.g. thematically, triangulation of data, saturation of data). Adequate description? Creditability tests? Analyzed with sufficient rigor? If so how?
Research relations	Researcher considered their own role with informants? Considers own biases? If so how?
Setting	Why particular research setting selected?
Ethics	Have the relevant ethical issues been discussed (e.g. ethical approval obtained)? Provide details
Findings	Clearly presented findings? Sufficient data to support findings? What criteria given for selecting examples from data?
Transferability	Sufficient details from research setting/context to determine similarities/differences? How transferable are findings to wider populations/settings?
Relevance & Usefulness	In terms of contributing new insights? Suggesting further research? impacting on policy/practice?

Note 1 - Content of IPE

Three categories of IPE:

- Common (where all students/groups learn the same content)
- Collaborative (where students/groups learn about one another in order to collaborate)
- Mixed (where students/groups receive a mixture of above two)

Note 2 - Educational Outcomes

Based on Barr et al (2005) expanded Kirkpatrick outcomes typology:

Level 1 – Reaction: These cover learners' views on the learning experience, its organization, presentation, content, teaching methods and aspects of the institutional organization. For example, timetabling, materials, quality of teachers. The second element here is concerned with changes to attitudes to IPE as a result of the event.

Level 2 – Learning: These will cover changes in knowledge, skills, competencies and attitudes. Interest here is those aspects that relate to interprofessional work and collaboration. Thus, one could concentrate on acquisition of:

- Modification of attitudes/perceptions* – These outcomes relate to changes in reciprocal attitudes or perceptions between participant groups, towards

patients/clients and their condition, other professionals, collaborative work, circumstances, care and treatment.

- d. *Acquisition of knowledge* of facts, concepts, procedures and principles (of work/ skills/ ethics of other professional groups, of group work issues and problems in collaboration). *Acquisition of skills & competencies* refers to thinking and problem solving (as these relate to collaboration in group tasks), psychomotor (collaboration – specific tasks e.g. minor surgery), social (group leader's skills, ability to work in groups, emotional and educational support of other professionals).

Level 3 - Behavioral change: this measurement will document transfer of learning to workplace. This is inevitably more complex as other factors intervene, such as support for change of behavior in the workplace or willingness of learners to apply new knowledge and skills. Further difficulties in ascribing changes of behavior due to learning can be other influences such as changes in legislation or procedures or changes in behavior of other team members. At this level, evaluation will need to observe changes in collaborative practices, application of interprofessional skills and competencies and demonstration of altered interprofessional attitudes.

Level 4a - Changes in organization practice: Structure and process of organization of care, health outcomes (more long-term). This is the most difficult area to show differences as an impact of one professional's changes in behavior depend on number of organizational constraints such as individual's freedom of action, position of responsibility in organization and support for innovation within the organization. In case of whole team undertaking a learning experience this level becomes a legitimate area for investigation especially if specific tasks and responsibilities of the team are clearly differentiated within the larger organization. As such, this level relates to wider changes in the organization/delivery of care, attributable to an education programme, such as interprofessional collaboration and communication, teamwork and co-operative practice, costs to the health and/or social care service.

Level 4b – Benefits to patients/clients: This final level covers any improvements in the health and well-being of patients/clients as a direct result of an education programme. Where possible objectively measured or self-reported patient/client outcomes will be used, such as: health status measures, disease incidence, duration or cure rates, mortality, complication rates, readmission rates, adherence rates, patient or family satisfaction, continuity of care, costs to caretaker or patient/client.