



Evaluating an Interprofessional Education Curriculum: A theory informed approach

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14 **Evaluating an IPE curriculum**
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16
17 1) Professor ES Anderson PhD, NTF, SRN, SCM, HV.
18

19
20 University of Leicester
21 Department of Medical and Social Care Education
22 107, Princess Road East,
23 Leicester LE1 7LA
24 Tel: +44(0) 116 2523767
25 Fax: +44(0) 116 2523748
26 Esa1@le.ac.uk
27

28
29 2) Professor Roger Smith PhD
30

31
32 Professor of Social Work
33 School of Applied Social Sciences
34 University of Durham
35

36
37 3) Professor Marilyn Hammick PhD
38

39
40 Professor Marilyn Hammick
41 Education & Research Consultant
42 Consultant to Best Evidence Medical Education www.bemecollaboration.org
43 Emeritus Professor Birmingham City University
44
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Evaluating an Interprofessional Education Curriculum: A theory informed approach

Introduction

Few interprofessional education (IPE) curricula¹ for integration within core profession-specific programmes have been fully described and those that have vary because of the need to accommodate local arrangements within participating health and social care programmes (Barratt, et al. 2003; O'Halloran, et al. 2006; Barr, 2007; Curren, et al. 2010). Despite this, there is strong agreement about the goal of preparing students for future collaborate practice (Freeth, et al. 2005; Gilbert, 2005), the intended learning outcomes needing to align to health and social care policy and professional body requirements (Thistlethwaite & Moran, 2010; World Health Organisation, 2010; Thistlethwaite, 2012) and for early theoretical understandings to be applied later within practice learning (Thistlethwaite & Nisbet, 2007). However, there is limited understanding on what works well and what to avoid, partly because of the relative lack of discussion between IPE curriculum developers of the theoretical or conceptual frameworks underpinning the rationale, structure and evaluation of curriculum design (Reeves et al. 2011; Reeves & Hean, 2013).

One of the challenges for IPE research is to articulate theoretically informed evaluation models which can begin to clarify the constituent [events and interactive processes that lead](#)

¹ 'Curriculum' here means a series of different learning activities designed to advance learning over time. The word programme is used interchangeably with curriculum in this paper. [IPE refers to interactive learning between learners from different professions as defined in the World Health Document of 2010.](#)

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3 to new knowledge and understandings (Frye & Hemmer, 2012). The term evaluation is used
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5 here to refer to well designed, valid and planned educational research rather than a post-
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7 learning measure used solely for educational quality purposes (De Bere, 2010). Generally,
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9 reported IPE evaluations are of individual initiatives, which form part of a curriculum, rather
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11 than evaluations of an entire curriculum. This partial means approach a failure to consider
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13 the entire programme which would present a better understanding of how to constructively
14
15 align IPE within core profession-specific curriculum at both pre and post-registration level
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17 (Biggs, 1993). A curriculum with misguided non-aligned learning elements, be these entire
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19 modules/units/placements or small events within modules/units/placements, may fulfil
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21 their intended learning outcomes and be enjoyed by students, but fail to build and affirm an
22
23 advancement towards the goals of IPE. We would argue that curriculum development
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25 requires an understanding of the whole learning journey to illuminate student engagement,
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27 highlighting IP events which progress learning and those with the least impact, while
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29 suggesting changes and identifying possible gaps. Lack of clarity on how learning helps to
30
31 achieve curriculum goals is not unique to IPE; for example, medical education continues to
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33 debate 'best evidence' for its curriculum and as such seeks constant affirmation of how to
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35 proceed (Harden & Lilley 2000; Regehr, 2004; Wolf 2000; Hammick, 2005), whilst seeking
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37 out conceptual frameworks to address complex problems and to develop possible solutions
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39 (Bordage, 2009)
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52 The curriculum evaluation reported here, was jointly established by three Higher Education
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54 Institutions (HEIs) with different histories, each educating different health and social care
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56 professionals. One university has a medical school with social work and operating
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3 department practitioner (ODP) programmes, another programmes in pharmacy, speech and
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5 language therapy, social work, audiology, nursing (all branches) and midwifery, and the
6
7 third, paramedics, occupational therapists and nursing education. Curriculum design was
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9 theoretically informed, combining knowledge of theories on social behaviour in groups from
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11 psychology and sociology and ideas about applied learning (Anderson, et al. 2014).
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19 Within the complexity of IPE curriculum where much is happening reflecting the multi-
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21 dimensionality so often found in social sciences and generating knowledge depends upon
22
23 understanding the qualitative nature of human relationships, at least as much as on the
24
25 application of quantifiable measures of learning gain and consolidation (Wong, et al. 2012).
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28 For this reason we used an evaluation model that would enable recognition of how the new
29
30 learning was received by students, faculty and practice. We recognised that change would
31
32 result from the dynamic interplay of factors relating to each learning moment along the
33
34 curriculum journey. Evaluation models we could have used include the 'CIPP
35
36 (context/input/process/product)' model (Frye and Hemmer (2012, p. 296), and Coles and
37
38 Grant's model which sees effective curriculum as three components which must align: the
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40 curriculum as agreed on paper, as realised in-action and experienced by the students (Coles,
41
42 1985).
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51 Our choice was the Biggs' 3 P Model, which enables consideration of the presage, process and
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53 product or outputs of student learning, the teachers journey in planning delivering and assessing
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55 outcomes and the patient story of engagement in the learning (Biggs 1993), and used elsewhere
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57 (Freeth, et al. 2005; Reeves & Freeth, 2006). The 3P model 'represents an integrated system' (Biggs,
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3 1989; Biggs, 2002), positing that the eventual outcomes of student learning depends on the
4
5 interaction between the 'presage' factors (student characteristics, teaching context and preparation)
6
7 and 'process' factors (student orientation to/engagement with learning, teaching style and
8
9 pedagogic content). The model's theoretical stance derives from complexity theory used previously
10
11 to explore IPE because of the additional layers of stakeholder views across different professional
12
13 curriculum (Barr, 2013). In addition we applied the Kirkpatrick typology of education outcomes
14
15 which have been modified for IPE, mindful not to be constrained by only these levels so that we
16
17 would consider all the consequences of the learning on all participants including the unanticipated
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19 (Barr, et al. 2005; Yardley & Dornan, 2012).
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26 This paper outlines our meta-analysis of our IPE evaluation made in order to retrospectively
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28 reflect and identify the key messages about what had progressed interprofessional learning
29
30 (IPL) in one locality. In so doing we aim to encourage theoretically informed evaluation
31
32 approaches to develop clarity about improving IPE curriculum. With hindsight we might
33
34 have done things differently, asking more theoretically informed questions for rigorous
35
36 testing because we failed to appreciate the complexity of the undertaking (Frye & Hemmer,
37
38 2012). In this we are not alone as authors continually request conceptual frameworks to
39
40 help illuminate best practice (Bordage, 2009). To this end, increasingly sophisticated
41
42 frameworks for evaluation are being developed (Frye & Hemmer, 2012).
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52 *Our Interprofessional Curriculum.*

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54 Policy in the UK, (DOH, 2000) propelled the establishment of a local group to develop our
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56 IPE strategy; a theoretical stance to support concrete developments in teaching and learning
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3 was drawn from psychology; in particular, utilising the contact hypothesis (Allport, 1954),
4
5 with attention to its adaptations for learning conditions within IPE to challenge traditional
6
7 stereotypes (Carpenter, 1995; Carpenter & Hewstone 1996). The design of individual
8
9 learning events was influenced by educational theories relating to the process of learning as
10
11 adhered to by cognitive constructivists such as Piaget (1973) extolling a staged process of
12
13 knowledge construction. Additionally, the process of social learning was considered, with
14
15 learning communities in practice supporting medical curriculum primed for later IPE
16
17 arrangements (Wenger, 1998; Anderson, et al. 2003). Social constructivist theorists such as
18
19 Bandura (1977) who place emphasis on constructing meaning through learning with others
20
21 in a social context were utilised. The curriculum was designed to encompass introductory
22
23 teacher-led learning, moved on to incorporate models of adult learning utilising self-
24
25 directed learning processes for both personal and group reflection (Knowles, 1978). We
26
27 used learning triggers for self-directed problem based learning which were socially
28
29 mediated through small-group study sessions allowing expansive ('deep') learning to
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31 emerge (Briggs & Myers, 1995; Engeström, 1987; Regehr, 2004; Bleakley, 2006).
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42 The separate HEIs, bound by different curriculum committees, and different professional
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44 programmes overseen by respective professional bodies, agreed a curriculum framework
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46 entitled the 'Three Strand Model', of IPL (Smith & Anderson, 2007; Anderson, et al. 2014).
47
48 This assured IPL was woven within existing modules within each respective school and it had
49
50 a the place in the curriculum, first, second, third year, varied where programmes ran beyond
51
52 three years, but always reflected the beginning, middle and end periods of study. IPL events
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54 were designed to be integrated into the programme framework; and ran for one, two, or up
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3 to four days. The final IPE curriculum progressed from early conceptualisations of what it
4
5 means to be interprofessional, delivered in classroom settings (strand one, one day)
6
7 followed by practice learning with patients/service users (strand two, two-days) and further
8
9 opportunities to work in practice with additional workshops and simulations (strand three,
10
11 one lasting four days with others lasting one day and where students attend more than one
12
13 event) (Figure 1).
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18 Insert Figure 1 Here
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21 A competence measure was used to assess student IPL because of its familiarity to the
22
23 majority of local health and social care curriculum developers. In this way learning outcomes
24
25 were established for assessing the development of knowledge, skills, attitudes and
26
27 behaviours. All disciplines agreed that students should complete an Interprofessional
28
29 Personal Portfolio to collate their reflections on their learning journey towards
30
31 interprofessional competence. Students were given theoretical models to guide their
32
33 reflections submitted as short essays after each IPL event. The reflections have now been
34
35 analysed and reveal how the learning triggered new knowledge and skills and framed future
36
37 intended behaviours (Domac, et al. 2015). In addition, the portfolio contained profession-
38
39 specific assessments to map against their various professional bodies' requirements for
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41 team working and collaborative practice.
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51 *The Evaluation Strategy*

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54 We employed a regional evaluator, [funded by the local health authority](#), from the outset,
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56 seeing this as integral to the development and sustainability of the local IPE curriculum,
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3 through prospective accounts of implementation and impact. The evaluation programme
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5 was supported by a regional research committee with representatives from each University,
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7 funders and drawing on recognised external expertise. Ethical permission for the curriculum
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9 evaluation was obtained from the outset in 2005 (COREC; 05/Q2502/104).
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16 Our evaluation model (Figure 2) considered the ‘assumptions of linear relationships
17
18 between program elements and desired outcomes’ (Frye & Hemmer, 2012), while paying
19
20 particular attention to the complexity of the views of all stakeholders, students and
21
22 educators, service and patients, to help us perceive how students advanced their
23
24 knowledge, skills and attitudes and the impact of IPL. Each individual learning programme
25
26 was evaluated against the Kirkpatrick outcomes levels (Table 1).
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29
30 *INSERT Figure 2 HERE*
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33 *INSERT Table 1 HERE*
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39 The evaluation methodologies included mixed methods and cyclical data collection in
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41 prospective action-based qualitative studies (Table 2). We used conventional
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43 ‘output/outcome’ evaluative methods, together with those which seek to look inside the
44
45 ‘black box’ (Carpenter & Dickinson, 2008) in order to gain a better sense of the processes of
46
47 joint learning and their implications for co-production of knowledge. Each element of the
48
49 overall IPE programme was extensively evaluated to ensure the continuous appropriateness
50
51 and continuity of learning. Different methodologies were implemented at different phases
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53 of the curriculum evaluation.
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3 *INSERT Table 2 HERE*
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9 Despite a clear rationale for designing our teaching based on theories of learning and a clear
10 theoretical rationale for the evaluation, we did not test theory in its application. In other
11 words, we failed to address some key questions, for example, how would different teaching
12 methods advance learning towards understanding interprofessional working? What are the
13 most effective programmes and why? How does contact make learning different? Why and
14 how does IPE advance learning? What are the cost implications of this new curriculum
15 theme? What are the impacts upon each school and HEI? Our mistake was unrelated to
16 methodological choices, as these were wide ranging to gather quantitative and qualitative
17 data, but rather in our focus on the overall programme aims. Thus our insights emerged
18 iteratively by applying a theoretical approach in- action.
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36 *The Outcomes from the Evaluation*

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39 Re-examining the evaluations highlighted what students were learning, why some teaching
40 approaches were better received than others and various issues from the experiences of all
41 stakeholders. Below we set out how, by applying theoretical insights, albeit retrospectively,
42 we made sense of what was happening.
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53 Considering first the '**presage factors**' we looked to see what issues constrained or
54 successfully progressed the IPE curriculum. Evaluation using the RIPLS questionnaire to
55 assess student readiness for IPL failed to reveal any substantive differences between the
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3 students prior to embarking on IPE for the first time (Table 3, exemplar 1) (Parsell &
4
5 Bligh,1999). Following the early strand one learning practical concerns were raised, such as
6
7 the teaching environment being often marginalised as IPE competed with established
8
9 schedules which received the best teaching rooms, teaching support and shared payment
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11 for teaching resources.
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19 Of *the process factors* the approaches to teaching for learning in early strand one, proved
20
21 most challenging and a number of issues required theoretical consideration. These
22
23 difficulties related to the development of professional identity which was largely
24
25 uninformed when the students first met and as they struggled to profess strong associations
26
27 to professions they knew little about. These tensions ran alongside the completion of the
28
29 learning activities. Stereotyping and emotional reactions permeated their evaluations and
30
31 reflective writing, similar to those found in other programmes (Table 3, Exemplar 1) (Hean,
32
33 et al. 2006). The formation of 'in-groups' and 'out-groups' as described by social identity
34
35 theory (Tajfel & Turner (1986) and the social gain from joining professional groups as
36
37 explained by social capital theory were key to helping us explore these findings (Bourdieu,
38
39 1997). To address these problems teaching content changed to engage students in
40
41 reflective exercises to unpack some basic understandings of team working in health and
42
43 social care using theoretical tools to explore student emotions and attitudes. For example,
44
45 exploring what is meant by emotional intelligence and why we naturally form stereotypes
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52 (Goleman, 1998; Druskat & Wolff, 2001).
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3 We identified the need for deeper and richer appreciation of how to manage small group
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5 IPE facilitation. This led to the design and delivery of a new faculty development
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7 opportunity (Table 3, Exemplar 2). This explored psychological and sociological theories
8
9 applied to human behaviours in groups, the sensitivities of interprofessional groups and the
10
11 management of group dynamics. This theoretical framework helped to explain how some of
12
13 the early IPE faculty sceptics changed their negative attitudes towards IPE to favour and
14
15 value the aspirations of this learning. Our evaluations identified that the sceptics re-
16
17 evaluated their attitude construction, explained by cognitive dissonance theory (Table 3,
18
19 Exemplar 3) (Festinger, 1957). The sceptic teachers were surrounded by positive role model
20
21 teachers and students who were clearly enjoying the IPE and as a result **came** to change
22
23 their cognition to favour and value this form of teaching. Clearly the first steps in curriculum
24
25 design required detailed understanding of theories of group behaviour. **Further**, despite
26
27 **initial** concerns the value of early classroom learning was subsequently highlighted against
28
29 the evaluations across the whole curriculum, as the **later findings** identified students'
30
31 readiness to engage in IPL events in practice because of this early learning (Table 3,
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33 Exemplar 4).
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45 In addition explanation of other poor strand one evaluations related to the alignment of the
46
47 new IPE learning theme within the corpus of the main professional curriculum and
48
49 integration of students' prior experiences. It became clear, and educators confirmed this
50
51 finding, that the new learning was not always explained and integrated with profession-
52
53 specific curricula, and students were heard saying '*why am I here?*' (Biggs, 2002).
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3 The most positive evaluations were for experiential learning in clinical teams with direct
4 patient/service user involvement, based on a modified Kolb learning cycle which enabled
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The most positive evaluations were for experiential learning in clinical teams with direct patient/service user involvement, based on a modified Kolb learning cycle which enabled constructivist learning through experience, reflection and analysis (Table 3, Exemplar 5). The

Strand Two 'Health in the Community' course was modified to accommodate the widening access of different student professions. Patient selection had to move on to those where the interplay of health and social care was evident and involved a broader range of professions including the voluntary sector. Reaching these understandings of practice-learning required many cycles of evaluations and this empirical research was invaluable (Table 3, Exemplar 4). Our practice-based learning in **Strand Three** has been adapted for community and hospital teaching; for example, in stroke and rehabilitation wards and in community mental health units. During these developments action learning approaches engaged all stakeholders in assessing the impact of the teaching experience on student learning and building on these insights (Table 3, Exemplar 6). In particular we have spent time listening to patients/service users and have been able to engage them within the teaching team (Table 3, Exemplar 7). This enabled us to grow practice-based communities of learning between participating professions, patients/service users and carers, learning facilitators and academics (Wenger, 1998). [These have ensured sustainability of this work, with community organisations now employing community IPE tutors.](#)

Of the **product factors** the outcome of the evaluation were mapped against the **Kirkpatrick framework** and wider consequences were collated. Pre- and post-test questionnaire scores identified student learning (Kirkpatrick level 2b) and the additional free text comments have confirmed student reactions (Kirkpatrick level 1) and intentions for future behaviour (working towards Kirkpatrick Level 3). Portfolio assessments offered insights into the

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3 students' subjective experience of IPE and their competence development. In-depth
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5 interviews and focus groups with students and educators were invaluable. Surveys, for
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7 example, demonstrate high levels of satisfaction and knowledge gain; on the other hand,
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9 this was balanced by more nuanced evidence provided through focus groups and interviews
10
11 with students, patients and other stakeholders. The results prompted us to revise our
12
13 teaching inputs and approach where certain disciplines had identified concerns, such as
14
15 feeling marginalised: *"I got there and the doctor or nurse in charge, she was always talking*
16
17 *to the two medical colleagues"*, (Table 3, Exemplar 8, p.236). This aspect of our evaluative
18
19 work enabled us to identify differences of perception and the challenge of dealing
20
21 constructively with problems arising from preconceptions and stereotypes. For example; *'I*
22
23 *do think this course gave a very good chance to see how social workers do and what I can as*
24
25 *a future clinician expect them to help me with as we work in a team, which I think was a very*
26
27 *good experience'* (Table 3, Exemplar 8, p236).
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36 Of particular value and very positively received was the opportunity to engage students in
37
38 shaping and designing learning (Table 3, Exemplar, 9). Discovering how students frame their
39
40 thinking came from comparative studies using uni and interprofessional groups (Table 3,
41
42 Exemplar 10). Student practice-based work on patient analysis showed how the
43
44 interprofessional student teams had an impact on patient care and organisational practice.
45
46 The outcomes of this learning reached the highest level of the Kirkpatrick framework,
47
48 affirmed in feedback from practitioners and patients (Table 3, Exemplar 11, 12). Here we
49
50 learnt that towards the end of their programmes interprofessional student teams can take
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52 on modified clinical responsibilities overseen by qualified staff providing a powerful vehicle
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54 for student learning and for supporting practice. Figure 3, relates to what is written above.
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6 *INSERT Figure 3 Here*
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10 *Strengths and Weaknesses of the evaluation tools*

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12 One of the strengths of this evaluation model is the combination of methods and the
13 triangulation of the different evaluation tools applied to different aspects of curriculum
14 development, namely presage, process and product. To examine outputs against the
15 Kirkpatrick evaluation framework we needed to apply a range of tools. For example, the IPE
16 portfolio offered invaluable feedback to curriculum committees in revealing the subtle step-
17 by-step learning across the curriculum (Table, 3 Exemplar 13). As Carpenter and Dickinson
18 (2008) argued, there is value in linking different aspects of the overall evaluation in a
19 'stepwise' approach, so that learner attributes are linked with measures of programme
20 integrity and impact and these in turn linked with subsequent outcomes in terms of
21 practitioner behaviour and patient/service user benefits (Carpenter, et al. 2007). Clearly
22 applying different conceptual frameworks can help to sharpen understanding and move the
23 curriculum to the next level of analysis; and this is further supported by the argument of
24 Frye and Hemmer (2012) who indicate that a combination of methods of evaluation may be
25 best suited to both the complexity of the field of practice represented by IPE, and to the
26 integration of varying theoretical perspectives.
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52 Our evaluation design provided the opportunity to follow the development of both novice
53 and experienced IPE faculty members along their learning journey. Insights included the
54 challenges for faculty development, such as training in the management of small group IPL
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3 facilitation and understandings of the value added aspects of IPE for health and social care
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5 professional programmes, while highlighting the benefits for educators working on
6
7 educational design and delivery for advancing personal and professional development
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10 (Table 3, Exemplar 14). In addition the burden of engagement with IPL as additional to core
11
12 uni professional learning resulted in an increased work-load for the IPE facilitators and new
13
14 management structures were needed to plan and trouble shoot so that increasing
15
16 workloads could be reconciled and support found to ensure that the benefits for personal
17
18 and professional development were not compromised (Anderson, et al. 2014).
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26 Discussion

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29 The report of our evaluation of an entire IPE curriculum takes place after several years of
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31 on-going cyclical delivery. We used the conceptual framework model elaborated by Biggs,
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33 considering *presage*, *process* and *product* in constructing an approach which linked
34
35 concrete evidence obtained in advance of and at the point of delivery (evaluation material),
36
37 with more discursive and wider-ranging follow up, which probed each step of the
38
39 curriculum, and was then more comprehensively articulated with the creative application of
40
41 theory. To consider impact in more detail we aligned outcomes to the Kirkpatrick Model
42
43 (Carpenter & Dickinson, 2008). Not all of our methods have been implemented as
44
45 comprehensively as we would like, with limited resources. We have, though, demonstrated
46
47 the overall practicality and potential added value of an evaluation strategy which
48
49 consciously and pro-actively links the stages in the process of preparing and delivering IPE,
50
51 and the outcomes from a range of stakeholder perspectives (Yarbrough et al, 2011). This,
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3 we argue, provides a degree of empirical validation for those systemic models of evaluation
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5 developed by Biggs (1989) and others (Kirkpatrick, 1998; Frye & Hemmer, 2012).
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12 We are not alone in trying to advance our understanding of IPE through considering the
13
14 application of theory (Reeves & Hean, 2013). Our results show that theory is a valuable tool
15
16 in the curriculum design and to synthesise and help explain our evaluation findings.
17

18
19 However, overall we found it challenging to [limit ourselves to testing](#) out one theoretical
20
21 model and argue that solutions for [both evaluating and enhancing](#) IPE rest with sequential
22
23 application of different conceptual frameworks [as Frye and Hemmer argue persuasively](#)
24
25 [\(2012\)](#). It is clear that there are only positive advantages to using an evaluation framework
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27 (Figure 2) which focuses on all elements of the learning experience from preparation to
28
29 'product', combined with considering all stakeholder views - students, teachers and patients
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31 (Biggs, 1993).
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39 One of the most important questions for those who establish pre-registration IPE is what
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41 makes for a good curriculum threaded throughout a profession-specific programme? We
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43 found that a progression of events starting with theoretical appreciation and moving into
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45 placement learning to examine the complexity of modern team working in a range of clinical
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47 settings is required. The most positive evaluations are for student engagement in practice
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49 (Anderson & Thorpe, 2014). The learning with and from the patient/service user's voice and
50
51 professional role models can develop a pathway of learning that appears to arrive at its goal
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53 of sensitising and equipping future practitioners for collaborative working. However,
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55 preparation with theoretical application must come early.
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5 There are still many unanswered questions relating to vertical and horizontal curriculum
6 alignment and robust assessment methodologies that can be used to determine progression
7 towards professional registration. We remain somewhat constrained in seeking to
8 determine what learning moments influence student learning towards being 'truly
9 collaborative' and or 'workforce ready' as envisaged by the World Health Organisation in
10 2010 (WHO, 2010); but we support the proposition, strongly endorsed in our study by
11 students across the range of professional disciplines, that learning together in practice is
12 essential. Despite the successes we have claimed, we recognise that IPL is (or should be)
13 consolidated while in practice.
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29 The approach to education evaluation is becoming increasingly sophisticated but its
30 progress is by no means complete. More insight is needed into the place of assessment and
31 the role of validated measures of observable team-based behaviours. Although some tools
32 for this are available there is no agreed measure and management for valid and reliable
33 results (Thistlethwaite, 2012). We are also aware of the continuing challenges of
34 demonstrating sustainable long term gains. [The integrated evaluation framework that](#)
35 [emerged from the process reported here represents a significant achievement.](#)
36 [Nevertheless , it could have been a more straightforward process had we adopted a](#)
37 [validated approach such as the CIPP model \(Frye & Hemmer, 2012\) from the outset, and](#)
38 [tested the research questions being asked by the World Health organisation concerning IPE](#)
39 [\(Gilbert, 2014\)](#)
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3 We are not presenting our evaluation design as a *fait accompli*, rather we look to share
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5 these experiences to propel the IPE community to consider whole and comparative
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7 programme evaluation using conceptual frameworks that can help to illuminate what works
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9 well, and why, and at the same time, takes forward IPE research. Indeed, although it was
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11 clearly not originally formulated as such, we could perhaps argue that our developing
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13 strategy has amounted to a form of 'meta-evaluation' (Yarborough et al. 2011), whereby
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15 each component is reviewed both in its own right, and in terms of its potential to contribute
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17 to the overall picture.
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24 We were able to support the employment of our programme evaluator for part of this
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26 period, and some small grants were from the Higher Education Academy and other sources.
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28 Indeed, the small scale and diffuse nature of the funding has been beneficial in many ways,
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30 in enabling us to develop our overall strategy piecemeal and by a more or less logical
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32 progression. The programme has remained in place since 2005 but is currently under review
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34 with in-coming senior HEI leads. Further work is planned (patient safety/simulation
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36 activities) and on-going cyclical reviews may bring changes.
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43 **Conclusion**

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45 Comparisons of medical education curriculum approaches are beginning to illuminate the
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47 benefits of different learning approaches and curriculum designs (Schmidt, et al. 1996).
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49 Although rigorous experimental evaluations designs such as Randomised Control Trials
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51 might identify the best curriculum models, pre-registration curriculum, professional body
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53 requirements militate against using such designs. However, we can use multiple evaluation
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55 methodologies which reveal curriculum effects on participants and faculty. We suggest that
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3 those setting out to plan or re-design IPE curriculum establish clear and systematic research
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5 questions for their curriculum, underpinned these by theory at the outset, and test both
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7 questions and the chosen systematically as their enquiries progress.
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10 11 12 **Practice Points**

- 14 • Underpin curriculum evaluation of interprofessional education with a theoretical
15 approach
- 16 • Assess IPE curriculum as a whole not as segmented learning pieces to advance
17 understandings of what works and why.
- 18 • Apply the concept of Biggs 1993, presage, process and outputs model to consider
19 curriculum issues
- 20 • Involve all stakeholders in any curriculum evaluation, students, faculty and patients
- 21 • Take an open and reflective approach to theory choices when making education and
22 evaluation decisions.
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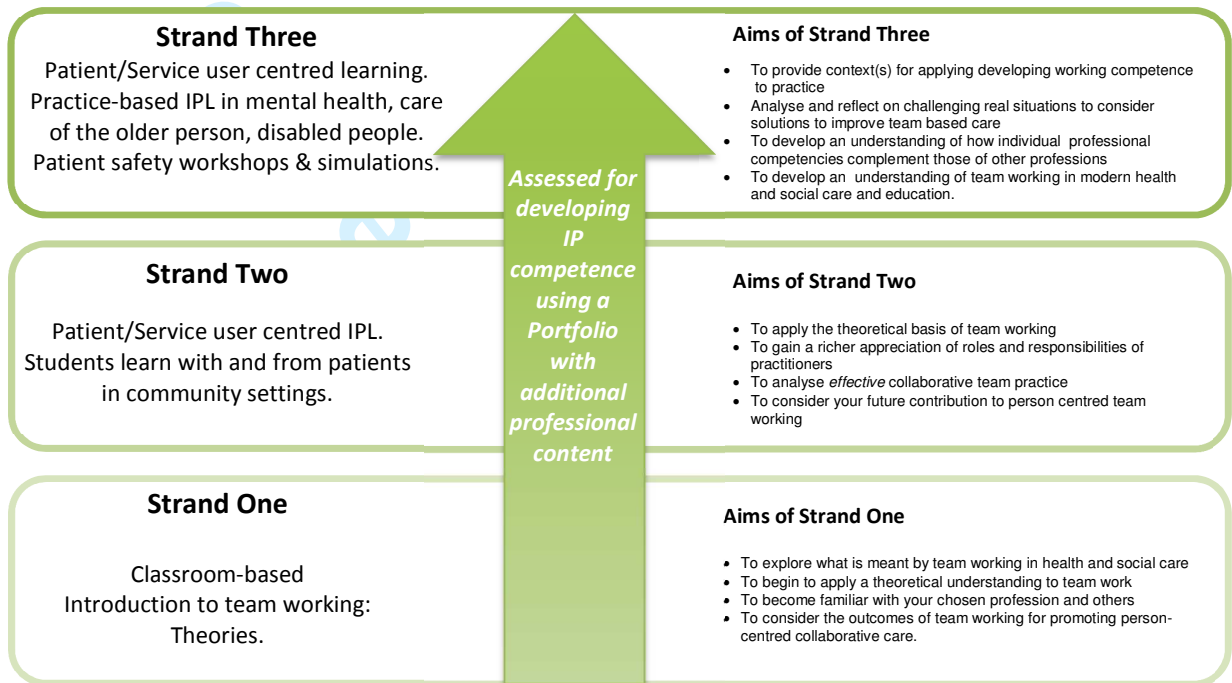
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For Peer-Review Only

Figure 1

The Framework for the curriculum



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Figure 2:



Evaluation Matrix Framework

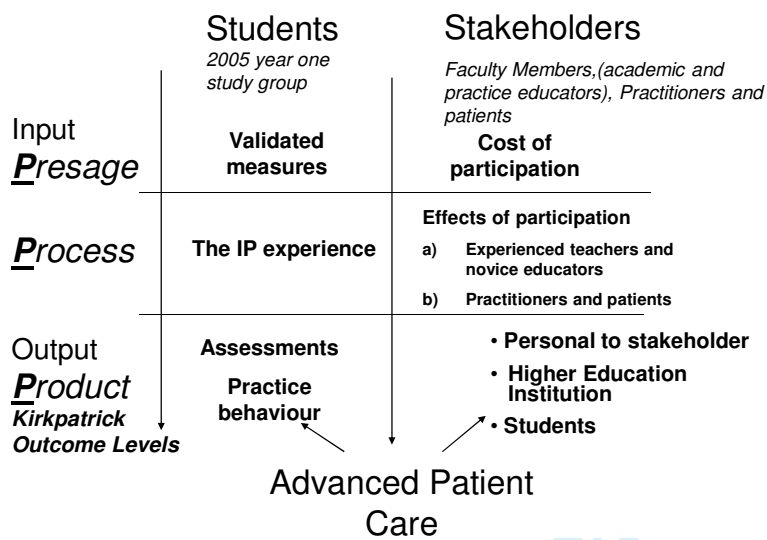


Figure 3: A flow diagram to illustrate the evaluation processes, application of theory to curriculum change or for faculty development

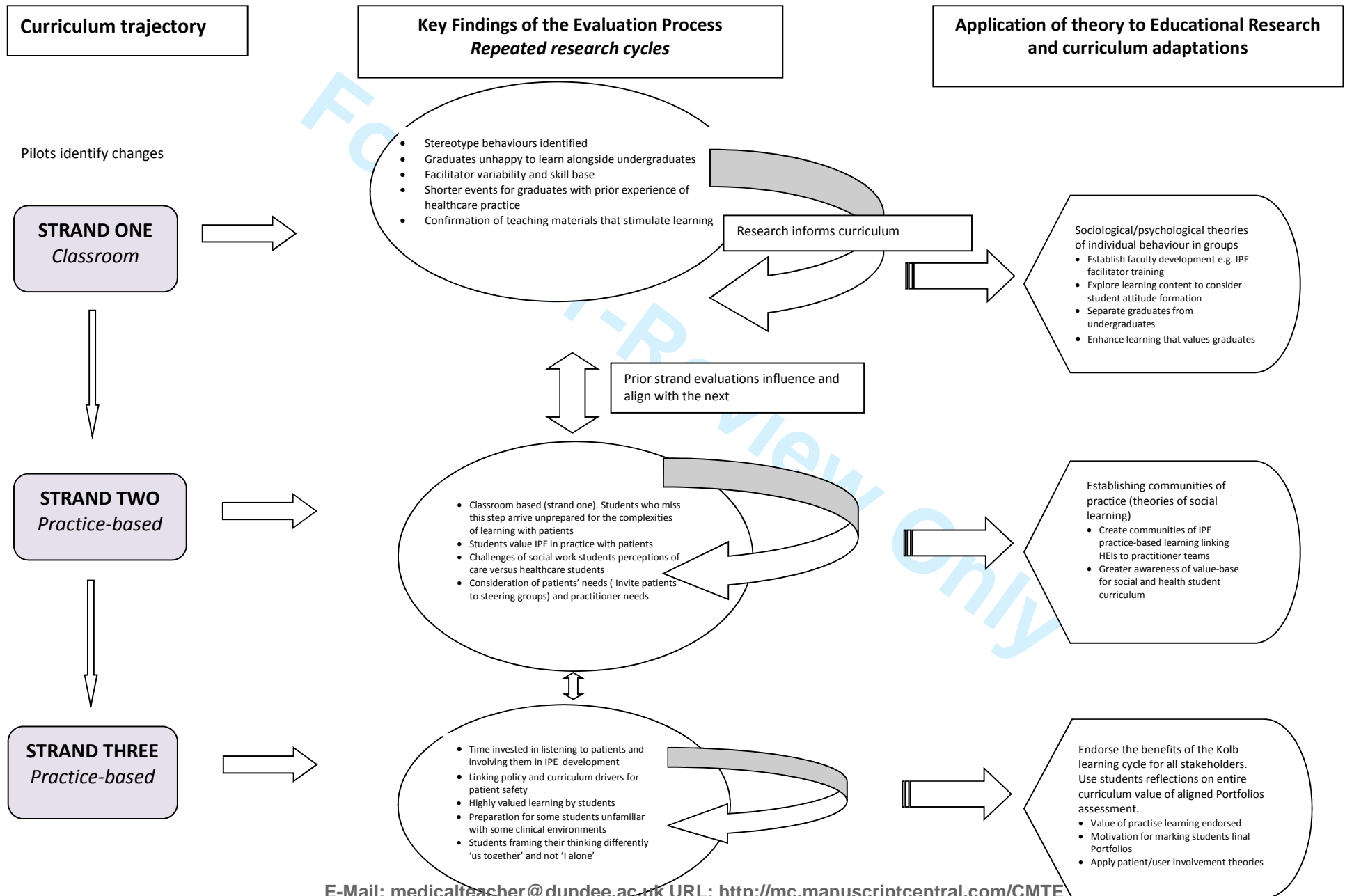


Table 1: Kirkpatrick Levels to assess the learning impact of the IPE in The Three Strand Model

Kirkpatrick Level		Data Collection Techniques
Level 1	Learners' Reactions	Focus group discussions Free text comments in questionnaires
Level 2a	Modification in attitudes and perception	Focus group discussions. Free text comments in questionnaires Scaling Measures: Likert Scales, RIPLs
Level 2b	Knowledge and skills	Pre and Post Questionnaires Portfolio Assessment Exam questions (short answer) Reflective Case studies Critiques of Practice
Level 3	Changes in Behaviour	Practice tutors feedback in Portfolio Student Statement of intent
Level 4a	Changes in Organisational Practice	Students Feedback forms to practitioners Student presentations Interviews with practitioners
Level 4b	Service Benefits to users and carers	Student Focus groups Service users involvement in teaching Case study evidence Student feedback to practitioners Interviews with practitioners

Table 2: Evaluation Methodologies

Data Collection Tools	Description	Rationale
<i>Validated questionnaires</i>	Readiness for Interprofessional Learning (RIPLes) questionnaire (Parseell & Bligh, 1999).	To form a baseline for regular assessment of change
<i>Questionnaire surveys</i>	Weighted Likert Scales	To assess student pre and post attitudinal change and knowledge gain. Scored questions were balanced with opportunities to express opinion in a narrative content
<i>Postal questionnaires</i>	Simple open questions	To patient/service users/carers and agencies provided an alternative opportunity for anonymous feedback and to reach a wider number and range of stakeholders
<i>Follow up questionnaires</i>	Using electronic surveys (survey monkey)	To exiting students at graduation and contactable alumni: Our greatest success has been from medical alumni, mainly because they have a longer period of training, and are more accessible for this purpose
<i>Student focus group</i>	Prompt questions led by the independent research evaluator	To enable students to consider the breadth of an experience
<i>Stakeholder focus group</i>	Prompt questions led by the independent research evaluator	To gain insights into the impacts and benefits of, for example, a practitioner team supporting IPE alongside their day-to-day practice
<i>One-to-one interviews</i>	Semi-structured	Faculty staff and other external stakeholders and with patients/service users
<i>Student recommendations (learning outputs) for improving practice from practice-based IPE</i>	Student feedback recommendations forms on their patient (case studies). These included quality improvements for patient care and service design	To assess the impact of the student learning for improving service delivery including feedback and suggestions to the professional teams on how to improve patient care.

Table 3. Research Findings Exemplars

Exemplars	Paper details
1	Anderson, E.S. & Thorpe, L.N. (2008). Early Interprofessional Interactions: Does student age matter? <i>Journal of Interprofessional Care</i> , 22(3), 1-19.
2	Anderson, E.S., Cox, D., & Thorpe, L.N. (2009). Preparation for educators involved in interprofessional education. <i>Journal of Interprofessional Care</i> , 23(1), 81-94.
3	Anderson, E.S., Thorpe, L.N. & Hammick, M. (2011). Interprofessional Staff Development: changing attitudes and winning hearts and minds. <i>Journal of Interprofessional Care</i> , 25, 11-17.
4	Anderson, ES. Lennox, A. (2009). The Leicester Model of Interprofessional education: Developing, Delivering and Learning from student voices for 10 years. <i>Journal of Interprofessional Care</i> , 23(6), 557-573.
5	Lennox, A. & Anderson, E.S. (2007). <i>The Leicester Model of Interprofessional Education. A practical guide for implementation in health and social care</i> . Higher Education Academy, subject centre Medicine, Dentistry and Veterinary Medicine. Special Report 9. ISBN 978-1-905788-45-3. (http://www.medev.ac.uk/resources/articles-and-reports-special-reports/ and http://www.medev.ac.uk/funding/61/mini-projects/historical_funded/)
6	Kinnair, D., Anderson ES, Thorpe, LN (2012). Development of interprofessional education in mental health practice: Adapting the Leicester Model. <i>Journal of Interprofessional Care</i> . 26:189- 197.
7	Anderson, E.S., & Ford, J. (2012). <i>Enabling Service Users to Lead Interprofessional Workshops to Improve Student Listening Skills</i> . Higher Education Mini Grant, Subject Centre, Medicine, Dentistry and Veterinary Medicine. Project No: MP220. Newcastle. http://www.medev.ac.uk/funding/7/22/funded/
8	Anderson, ES. & Smith, R. (2010). Learning from Lives together: lessons from a joint learning experience for medical and social work students. <i>Health and Social Care in the Community</i> , 18(3), 229-240.
9	Anderson, ES., Ford, J. & Thorpe, LN. (2011). Learning to Listen: Improving student's communication with disabled people. <i>Medical Teacher</i> , 32,1-9.
10	Anderson, E.S., Thorpe, L.N., Heney, D. & Petersen, S. (2009) Medical Students benefit from learning about patient safety in an interprofessional team. <i>Medical Education</i> , 43, 542-552.
11	Anderson ES. & Thorpe (2010). Learning Together in Practice: an interprofessional education programme to appreciate teamwork. <i>The Clinical Teacher</i> , 7,19-25.
12	Anderson ES, Thorpe, LN. (2014). Students improve patient care and prepare for professional practice: an interprofessional community-based study. <i>Medical Teacher</i> . 36: 495-504.
13	Domac, S., Anderson, E.S, O'Reilly, M. & Smith. R. Assessing Interprofessional Competence Using a Prospective Reflective Portfolio. <i>Journal of Interprofessional Care</i> – in review
14	Anderson, E.S. & Thorpe, L.N. (2010). Interprofessional Educator Ambassadors: An empirical study of motivation and added value. <i>e-Medical Teacher</i> , 32, e492-e500.
15	Lennox, A. & Anderson, E.S. (2012). Delivering quality improvements in patient care: The application of the Leicester model or interprofessional education. <i>Quality in Primary Care</i> , 20(3), 219-226.