

Abstract.

Purpose- Continual professional development is essential to foster and enhance professionals' abilities. A wide variety of methods have been adopted to support professional learning for healthcare professions but many still focus upon a need to update knowledge and the learning of isolated competencies for practice. This paper reports upon a collaborative partnership that enabled the reframing of a professional development course away from this objectivist epistemology to foster pedagogically appropriate approaches nurturing the development of the knowledge and skills required for extended practice in specimen dissection.

Design/Methodology/Approach – An action research approach informed this study which drew upon aspects of simulated learning, 'creative play' and 'hands-on' practice to nurture development of the knowledge and mastery of essential skills required for extended practice in dissection. A questionnaire allowed the gathering of quantitative and qualitative data from delegates. Open coding of delegate free text responses enabled thematic analysis of the data.

Findings – Delegates reported upon a positive learning and teaching experience providing them with a unique opportunity to develop the essential skills and knowledge required to enhance their extended practice. Four key themes were identified from delegate feedback: *legitimacy of learning experience; safe-space for learning; confidence as a practitioner; professional and social interactions.*

Originality/value – Research into skill development in this field is currently lacking. Findings highlight the value of a creative approach to professional development which enables individuals to master the skills required for practice. It also underlines the importance and value of collaborative partnerships. As allied health professionals advance and extend their roles professional development must move away from the didactic delivery of isolated topics and ensure that it offers legitimate learning experiences allowing skill development and technique mastery alongside knowledge enhancement.

Keywords Continual professional development, Professional Learning, Collaborative partnerships, Creative learning, simulated learning

Paper type Research paper

Introduction

Education for healthcare professions aims to prepare not only qualified practitioners but also capable practitioners who are independent learners able to cope with the ever-evolving field in which they practice. Professional development supports practitioners to address their learning needs throughout their professional lives. In doing so it enables effective and capable practice as well as facilitating career progression for the individual. In addition to the benefit of addressing individual practitioners' learning needs a framework of continual professional development is also essential in ensuring the delivery of a high quality and effective healthcare provision for patients (Cole, 2009).

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3 A wide variety of methods have been adopted to support continuous professional
4 development (CPD) for the healthcare professions, including attendance at conferences,
5 seminars, lectures, tutorials, workshops and the use of digital technologies to enable on-line
6 or distance learning. These all aim to ensure that individuals maintain the ability to practice
7 safely, effectively and legally within their evolving scope of practice (HCPC, 2019).
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11 12 **Professional development – theoretical perspectives** 13 14

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16 Extensive research has been undertaken to identify best-practice within the design and
17 delivery of effective approaches to support professional development. An analysis of this
18 research is outside the scope of this paper, however, there is a consensus within the studies
19 that professional development should be based upon professional learning that is
20 continuous, active, social and related to practice (Garet et al, 2001; Hopwood, 2015;
21 Webster-Wright, 2009; Wilson & Berne, 1999). It is widely accepted that professionals learn
22 through practice experience. The theoretical basis of this approach is underpinned by the
23 work of American Philosopher, John Dewey and his views on the role of experience and
24 reflection for learning. Dewey (1938) suggested that opportunities for reflective thinking were
25 encouraged primarily by practical events that created feelings of disquiet or confusion or by
26 a sense of wonder and awe. Being reflective requires active consideration about actions and
27 their consequences and has a valuable role in supporting change. In addition, Lave and
28 Wenger (1991) identified communities of practice as a sociocultural entity with an important
29 role in supporting professional learning. In such communities, individuals share knowledge
30 rather than just reflecting upon their own practice and develop ways of participating within
31 their field or discipline. In doing this, the community shape their professional practice.
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43 Government directives published in the late 1990s and early 2000s (DOH, 1998; DOH, 1999;
44 DOH, 2000) set out an extensive agenda for change which brought into focus improving
45 quality standards, efficiency, openness and accountability in the NHS through the
46 implementation of national frameworks and standards. This focus upon competence
47 standards has resulted in many professional development activities concentrating upon
48 addressing content rather than the learning experience of practitioners (Webster-Wright,
49 2009). An outcome of this is that many professional development activities concentrate upon
50 the need to update-knowledge and the learning of isolated competencies for practice.
51 Webster-Wright (2009) argues for a reframing of professional development that moves away
52 from this focus upon meeting standards and achieving measurable outcomes and the
53 objectivist epistemologically stance taken in such programmes. When an objectivist stance is
54 taken, knowledge is seen as something that can be transferred from teacher to student and
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3 is primarily cognitive. Courses that focus upon the measurement of activities and outcomes
4 to support CPD are not necessarily designed to acknowledge and embrace a social
5 constructivist approach to learning or one in which practitioners are encouraged to
6 experiment and take risks, make mistakes or adopt different approaches that take them out
7 of their comfort zone. A creative learning approach, however, fosters social interactions and
8 promotes active and reflective learning (Loi and Dillon, 2006). When the focus is shifted
9 away from measuring defined outcomes individuals are empowered to be creative and
10 embrace uncertainty – they are given opportunity to grow through experiences and to use
11 their own creative abilities in activities that have meaning (Dewey, 1938).
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19 Creative learning can be defined as ‘any learning which involves understanding and new
20 awareness, which allows the learner to go beyond notional acquisition, and focuses on
21 thinking skills’ (Ferrari et al, 2009). Unlike cognitive approaches, creative learning is learner
22 centred and nurtures learner empowerment. Embracing innovative and novel teaching
23 approaches has been demonstrated to foster creative learning through encouraging active
24 and collaborative learning that is relevant to practice (Loi and Dillon, 2006). Utilizing creative
25 experiential activities within a professional development course taps into both the cognitive
26 and affective learning processes of practitioners. In this context, activities may be defined as
27 a form of play in which they facilitate creative and cognitive processes including divergent
28 thinking, mental transformations of existing ideas to new ideas, problem framing and
29 evaluative ability (Mainemelis and Ronson, 2006). Play involves boundaries in time and
30 space where the actual play is within a limited time and space in which normal social rules
31 may be suspended and people do something they normally do not. Play or playful
32 situations, particularly those that create positive safe experiences can foster creativity and
33 enhanced cognition in individuals including improvements in learning and memory. The
34 positive effects of play can be enhanced by the type of play in which an individual is involved
35 and in particular physically active play seems especially useful in enhancing creativity and
36 academic ability (Mainemelis and Ronson, 2006). The place or context in which learning
37 takes place is an integral part of this learning journey. Therefore, the design of professional
38 development activities, the relationships between the individuals involved, the activities
39 undertaken and the place where the learning takes place need to be considered carefully to
40 ensure that authentic professional learning occurs; maximising the learning opportunities to
41 meet the needs and aspirations of each practitioner (Garet et al, 2001).
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57 **Background to the study**

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3 Biomedical scientists (BMSs) within the National Health Service (NHS) enter the profession
4 with an undergraduate degree as well as having undertaken preregistration training in
5 practice to allow professional registration with the Health and Care Professions Council
6 (HCPC). BMSs carry out a range of laboratory and scientific tests that are essential in
7 supporting the diagnosis and treatment of patients. In recent years, there has been a step
8 towards extended roles for this group of scientists, to allow senior BMSs to perform more
9 advanced tests and techniques normally performed by medically trained staff. This reflects
10 the general increase in skill-mix occurring in other areas within the NHS, as recommended in
11 various publications by the Department of Health (DOH, 2001; DOH, 2012)
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19 Histopathology is a discipline within biomedical science which encompasses the diagnosis
20 and study of diseases of tissues. It involves histopathologists (medics) examining tissues
21 and cells under a microscope to enable a diagnostic report to be issued to assist clinicians in
22 managing patients' care. Specimen dissection is an essential first stage of this process and
23 one of the most important stages in histopathology. The Royal College of Pathologists
24 (RCPATH) issued guidance for the involvement of BMSs in specimen dissection in 2001; a
25 role that has been traditionally performed by histopathologists. Following the RCPATH report
26 defining this advanced role many histology departments in NHS Trusts introduced posts for
27 BMSs that reflected these extended roles. The Institute of Biomedical Science (IBMS) is the
28 professional body for scientists, support staff and students in the field of biomedical science.
29 In response to the development of extended roles for BMSs the IBMS and RCPATH
30 developed the Diploma of Expert Practice in Histological Dissection. The Diploma enables
31 individuals to evidence the scientific and clinical knowledge that underpins the practice of
32 dissection and the practical competence required to accurately dissect specimens. It is a
33 professional vocational qualification assessed by completion of a portfolio of evidence and a
34 written examination. A training logbook and portfolio of evidence are designed to provide a
35 record of an individual's training as well as evidence of regular assessments by a named
36 consultant pathologist supervisor. The consultant assesses the BMSs competence in
37 reporting the specimen types they dissect. Once the consultant is satisfied that training is
38 complete, the BMS submits the training logbook and portfolio. Successful assessment of the
39 portfolio by the IBMS is required for candidates to progress to sit a written examination
40 (IBMS, 2019a).
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55 In the context of the Diploma of Expert Practice in Histological dissection, developmental
56 support for individuals undertaking this qualification should not only prepare them for the
57 assessment but more importantly ensure that it fosters the growth of capable practitioners
58 who are independent learners able to apply their knowledge expertly in everyday practice.
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3 Specimen dissection requires critical and flexible thinking and problem solving when
4 uncommon samples are encountered in the day-to-day workload.
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8 **Context for this study**

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11 Research suggests that many professional development courses and practitioner update
12 sessions still follow a didactic delivery model where information is delivered completely
13 separated from authentic work experiences (Gravani, 2007; Smith, 2018). For practitioners
14 undertaking the Diploma of Expert Practice training is delivered in-house with additional
15 resources such as past-papers and reading lists provided on the IBMS website. The only
16 course available providing additional support for individuals was a classroom-based
17 programme covering the theoretical knowledge for the modules covered by the
18 RCPATH/IBMS Diploma. We identified a need for a programme that not only provided
19 practitioners with guidance for the theoretical knowledge required to pass the written
20 examination, but also a safe-space where practitioners could develop their confidence and
21 skills to allow them to accurately apply that knowledge to practice; developing capability for
22 practice. The aim was to build upon the skills practitioners were developing as part of their
23 in-house training, but allowing them to do so within a community of practice where they
24 could draw upon the knowledge and experience of tutors and their peers.
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34 **The study**

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38 This paper reports on a collaborative partnership formed to develop a new Specimen
39 Dissection course. It investigates the value of bringing together individuals with differing
40 skills and experience to design and develop an effective pedagogical approach to enable
41 appropriate professional learning and support practitioners to effectively transition into their
42 extended role in specimen dissection. In drawing upon the expertise of individuals with
43 experience in course design, pedagogy, professional requirements and practice for
44 dissection the aim was to develop novel and creative approaches to supporting professional
45 learning that addressed the need for active and social engagement directly relating to
46 practice in the workplace.
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54 **Course development and design**

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57 A participatory action research approach was drawn upon for this study with the expertise of
58 each member of the team contributing to the development of novel and creative approaches
59 to ensure professional learning was maximised for those attending the course. The course
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needed to meet the learning needs of practitioners currently working or wishing to move into the practice of specimen dissection. As outlined above, there is a consensus within the literature that professional development should be based upon professional learning that is continuous, active, social and related to practice. We, therefore, drew upon three key features in the literature to frame the development of the course:

- **Learner driven, and learner centred** – BMSs are practicing professionals whose current practice has provided them with an informed understanding of the knowledge and competencies that they wish to improve or develop. The course needed to accommodate a diverse group of individuals with different experiences, skill level and at different stages within their training. Professional development does not follow a linear pathway and practitioners will wish to select and prioritise according to their actual and perceived needs (Fenwick, 2013).
- **Interactive** – research has shown professional learning is less likely to occur when individuals are presented with clinical practice guidelines, didactic presentations and printed materials. Interactive workshops are more likely to support practice learning and development than didactic sessions alone (Bluestone et al, 2013).
- **Actual professional practice** - Professional development courses have a much greater impact the closer they are aligned to the actual professional practice setting of the learner. Learners need to be able to relate to how they will be applying their newly developed skills within the working environment (Mattheos et al, 2010)

To address these, firstly, the course was designed so that practitioners could attend the whole course or individual days depending upon their specific requirements, work commitment and learning needs. The first two days of the course addressed general theoretical concepts and information about the Diploma and its requirements. The other three days focused upon specific anatomical sites and application of theory to practice. Delegate numbers were kept to below twenty to encourage a more collaborative approach and development of a community of practice, with peer-peer interaction and tutor-peer interaction at the centre of each session. This was supported by the classroom format; a traditional classroom arrangement was abandoned and we ensured that face-to-face contact could be maintained between all those on the course (tutors and delegates) during all sessions.

Some material was delivered in a didactic format although due to the small group size tutors were able to ensure that delegates took part in question and answer sessions and engaged in discussions throughout these sessions. In addition to the course size, the environment in which the course was delivered supported an interactive approach to learning. The university

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3 setting allowed all teaching to be undertaken in one large learning space. This learning
4 space supported course delivery since tutors could move from discussing the theory of
5 dissection to demonstrating it and then allowing delegates to gain hands-on experience
6 themselves. Not having to move between rooms or being restricted by scheduled timetabling
7 and having all the resources in one place not only supported a more interactive approach but
8 also a learner driven/learner centred one. Each tutor could easily adapt their delivery to meet
9 the specific needs of the group.
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16 Professional development courses are essential to develop practitioner confidence and to
17 assist them to overcome any barriers they encounter in their practice. We wanted individuals
18 to be able to develop their skills in a safe-space where they could be challenged but not
19 have the worry of making mistakes that would impact upon patients. Safe-spaces can be
20 established by developing relationships with students that are inclusive (Hockings, 2011),
21 creating an environment where individuals feel at ease and able to participate fully without
22 fear of ridicule (Arao and Clemens, 2013). We wanted to provide the delegates with as close
23 to real-life experience as possible. The use of animal tissue was considered to support the
24 development of certain skills, however, it would not allow us to recreate specific pathological
25 conditions. We required an alternative approach that could simulate practice in the
26 workplace. Simulation is now a key component of medical education with many procedures
27 being taught using a range of different approaches to simulation (McGaghie et al, 2016).
28 Simulation approaches range from high-tech virtual reality simulators, full-scale mannequins,
29 plastic models, animal or animal products, and human cadavers, to screen-based systems
30 (Sørensen et al 2017). Collaboration between members of the team supported creativity and
31 encouraged thinking outside-of-the-box. This resulted in the design of activities that
32 mimicked real-life specimen dissection. A range of simulated activities were developed that
33 allowed delegates to master their knife skills, specimen orientation skills and dissection
34 knowledge. Pasta, vegetables and mushy peas were found to be a suitable alternative to
35 simulate both the shape and texture of clinical samples. Different food-based products and
36 modelling clay were used to recreate scenarios that the BMSs may be exposed to in their
37 dissection practice: from receipt of a skin excision sample to part of the large bowel with a
38 tumour inside.
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54 Delegates were asked to complete an evaluation survey at the end of each course to provide
55 feedback on content, delivery, learning and teaching environment, as well as the
56 appropriateness of pre-course information and general aspects of the course. The aim was
57 to identify areas of good practice as well as areas for improvement to feed into the
58 development of subsequent courses. In addition, in keeping with an action research
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3 approach, the team met on a regular basis to reflect on their experiences and to discuss
4 ideas to feed into the development of the course.
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8 Delegate feedback from each iteration of the course was reviewed and evaluated enabling
9 the team to draw upon the experiences and success of approaches. This informed
10 development of the props used for simulation. By the third iteration of the course a range of
11 different props had been developed that reflected the majority of dissection requirements
12 and scenarios that practitioners would encounter. Course delivery became a more
13 interactive and collaborative partnership between delegates and tutors with each iteration.
14 Educational design of the Specimen dissection course was therefore guided by the learning
15 objectives/requirements of the award as specified by the professional body (IBMS 2019b)
16 but more importantly by a creative approach to develop an appropriate learning environment
17 to meet the needs of the learners.
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25 A Likert scale was used in the course evaluation survey to obtain quantitative data providing
26 feedback on delegates' perception of their experience, from excellent to poor. In addition,
27 free-text comments were also gathered allowing delegates to provide more personal
28 reflections on the course. They were asked to provide feedback on each of the timetabled
29 sessions, the general organisation of the course, the venue, and time allocations for
30 sessions. In addition, questions were posed as to whether the course met their learning
31 objectives or perceived developmental needs, what they enjoyed most about the course and
32 finally suggestions for improvement. Thematic analysis of the free text responses was used.
33 Open coding allowed us to develop codes describing, naming or classifying concepts within
34 the free-text through the use of simple words or a short sequence of words.
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43 Findings

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45 Quantitative data from the evaluation questionnaires identified that the course was enjoyed
46 by the delegates and that it met with their expectations. Figure 1 summarises the overall
47 assessment of the last iteration of the course with 17 delegates responding to the question
48 'Overall assessment of the course'. This encompassed all aspects of the course, including
49 taught sessions, teaching environment and teaching materials. Delegates rated the course
50 as either excellent or good. Importantly, all delegates from the three iterations of the course
51 responding to the question 'Did the course meet your learning objectives?' stated 'yes' with
52 one delegate adding '*More than met*'.
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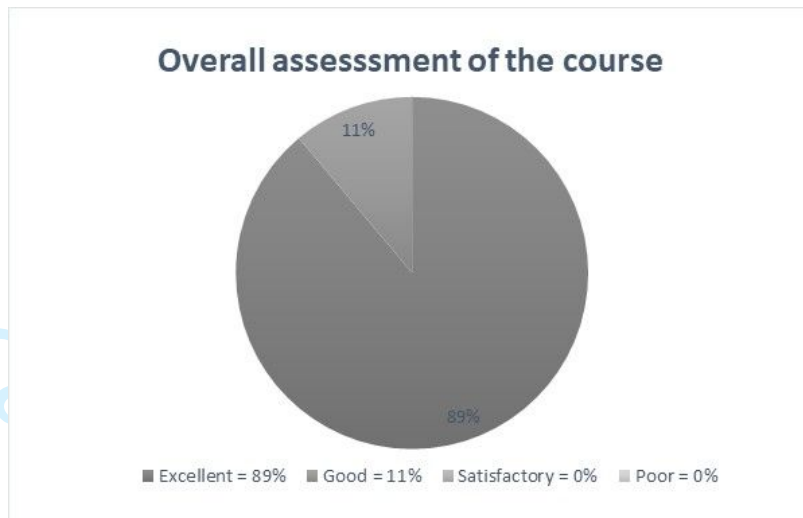


Figure 1 – Pie chart summarising delegate responses to the question ‘What was your overall assessment of the course?’ (n=17)

Although feedback was extremely positive we wished to develop a more nuanced understanding of how and why the course had met their expectations, and which aspects they felt fostered their professional learning most. Feedback was anonymous and evaluation forms were randomly assigned an identifier e.g. *Del 1*. Thirty evaluation forms were received in total from the three iterations. Open coding of the free text responses provided on the evaluation form enabled thematic analysis of the data. Four key themes were identified: *legitimacy of learning experience; safe-space for learning; confidence as practitioners; professional and social interactions* as illustrated in figure two.

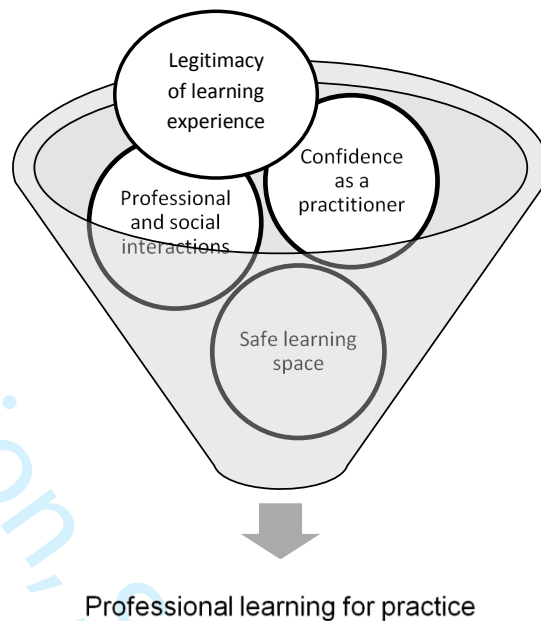


Figure 2: Diagram illustrating the main themes identified through coding of delegates' free text responses in the end of course evaluation questionnaire.

Studies into supporting professional learning have highlighted how there is a much greater impact upon learning the closer the activity is related to the actual professional practice setting of the learner (Bluestone et al, 2013; Cervero and Daley, 2016). Using vegetables, pasta and mushy peas to simulate experiences of specimen dissection for the delegates was risky. However, the feedback was positive and the pathologists drew on this feedback plus the support and encouragement from members of the team to be more adventurous with their workshops. Delegates appreciated the effort that was put into developing these sessions:

The practicals were amazing, really impressed with how much detail went into recreating real life organs. The teaching was excellent and really interactive (Del 24).

I loved all the thought that has gone into creating the specimens from playdoh/vegetables (Del 25)

As can be seen from excerpts from free text comments, delegates found these simulated activities a positive experience. More importantly, they perceived using the simulated organs as a legitimate learning experience, acknowledging that the simulated activities allowed them to develop their dissection skills and learn new techniques. Surprisingly, analysis of the free text comments identified how when describing the activities they referred to the simulation as if it was a 'real specimen' rather than a simulated activity:

Loved the practical session with prostate – this was really helpful (Del 21)

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4 *Enjoyed the practical especially the neck dissection (Del 26)*
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7 The language used by the delegates such as 'session with prostate' and 'especially the neck
8 *dissection*' suggests that although actual organs were not being used, the delegates saw
9 these simulated dissections as the-real-thing – they didn't relate it to the vegetable, pasta or
10 modelling compound used. Additionally, the delegates were able to see how the skills they
11 were developing supported their practice and were relevant to their development:
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16 *Inking experience was fun and really appropriate for the next stage in my*
17 *development (Del 18)*
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20 The interactive and practical nature of course delivery ensured that delegates, all at different
21 stages within their professional career, were able to gain something from the experience and
22 relate it to their personal learning needs. The interactive workshop approach allowed a
23 degree of autonomy for the delegates enabling them to learn and develop new skills or to
24 improve upon their current skill set:
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29 *I am already experienced in skin dissection but enjoyed applying these skills within*
30 *this module (Del 16)*
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33 This approach was seen to engender a feeling of being within a safe-space and one that
34 supported confidence as a practitioner. Delegates commented upon the 'friendliness' (Del 2)
35 of the tutors and that they were 'approachable' (Del 5) answering questions and providing
36 supportive feedback on their skills. The session on dissecting gastro-intestinal specimens
37 used pasta tubes to simulate this organ. Delegates commented that being able to practice a
38 technique not only allowed them to apply what they had been learning but also built their
39 confidence in their own ability as an advanced practitioner:
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46 *Really improved my background knowledge and therefore confidence when opening*
47 *GI [gastro-intestinal] specimens (Del 28)*
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49 Being able to practice techniques without the fear of doing something wrong and so
50 impacting upon a patient's potential diagnosis and care enabled professional learning to take
51 place but within a safe-space. The approach taken allowed individuals to experiment but
52 without the potential consequences that could result from making errors in the clinical
53 setting. This reduction in levels of stress as a result of being in a safe cognitive space fosters
54 a deeper approach to learning (Khechara and Smith, 2018). Delegates could practice and
55 refine their technique so building their confidence for practice. The creative approach
56 adopted for learning dissection stimulated the development of new awareness (Ferrari et al,
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2009). It allowed delegates to become producers of knowledge rather than consumers. This is essential within professional learning to support practitioners when they face new situations or more complex situations within the workplace (Webster-Wright, 2009). Creative learning is learner centred and research suggests that it nurtures learner empowerment. The statement from a delegate that '*I feel inspired and empowered*' (Del 28) when asked for any additional comments on the course suggests that this was achieved as well as fostering a passion for their profession and confidence as a practitioner. One delegate summed up the atmosphere of the sessions really well with their feedback on what they had enjoyed most about the course:

.....we became a mini-team for a week (Del 5)

This comment suggests that the learning environment resulted in collegiality and a community of practice encompassing both delegates and tutors on the course. Studies have shown that deeper learning results from such an environment where individuals support and learn from each other. Knowing is an activity by people with the construction of identities and relationships within specific circumstances (Lave and Wenger, 1991, p.52). Learning occurs through mutual engagement in an activity, located in an evolving network of relations focusing on activities and knowing rather than outcomes. This leads to the final theme of professional and social interactions identified from the coding of feedback. There were many comments about how delegates found hearing about others' experiences and practices a really useful resource. For example when asked what they found enjoyable about the course we received comments such as:

Meeting others on the course and hearing their personal experiences relating to dissection (Del 7)

Meeting other colleagues and comparing work practice (Del 14)

These stress the importance of shared experiences (both good and bad) and enabling an environment in which they can be exchanged and learning experiences discussed. Networks involving supportive feedback with tutors and peers making an effort to understand the issues being encountered enabling the provision of clear explanations is essential to support professional learning (Trigwell, Prosser and Waterhouse, 1999; Hockings, 2011). Research emphasises that learning is situated in everyday social contexts and that learning involves changes in participation in communities, rather than the individual acquisition of abstract concepts separate from interaction and experience (Wenger, 1998; Engestrom, 1996) so often seen in professional development courses. The course approach fostered such a community: connections and professional relationships made during the dissection courses

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3 extended beyond the time spent on the course. Such networks underpin continual
4 professional learning and development (McArdle and Coutts, 2010).
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8 **Conclusion**

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10 The pedagogical approach adopted for the Specimen Dissection course provided BMSs with
11 the opportunity to develop and refine their skills, repeatedly if necessary, using simulated
12 activities without putting patients at risk. The approach offers unique opportunities for active,
13 complex, and infrequent dissection situations to be practiced and managed. Human
14 performance is strongly influenced by the situational context, and our findings demonstrate
15 that the course design fosters interaction between the task, the environment, and
16 colleagues, engendering learning for professional practice. The findings identify the need for
17 further research into the role of creative learning and simulation not just within courses but
18 throughout an individual's training to support professional learning and mastery of skills
19 required for practice. As biomedical scientists and other allied health professionals advance
20 their roles and undertake the tests and techniques normally performed by medically trained
21 staff, professional development must move away from the didactic delivery of isolated topics
22 and ensure that it offers legitimate learning experiences allowing skill development and
23 technique mastery alongside knowledge enhancement.
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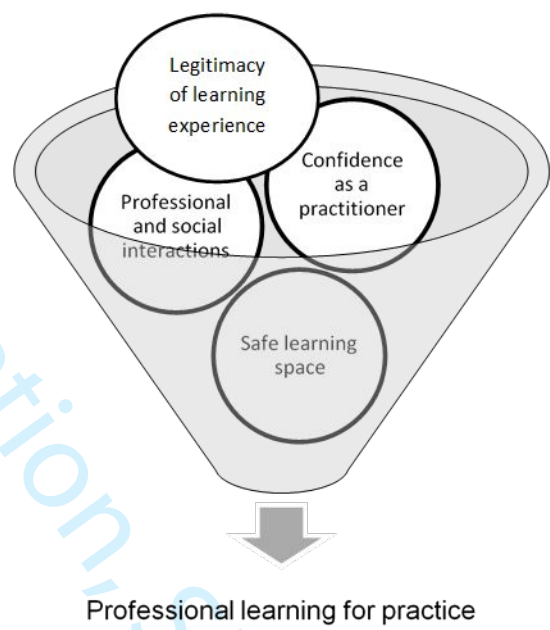


Figure 2: Diagram illustrating the main themes identified through coding of delegates' free text responses in the end of course evaluation questionnaire.

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