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

**Professional development – theoretical perspectives**

Extensive research has been undertaken to identify best-practice within the design and delivery of effective approaches to support professional development. An analysis of this research is outside the scope of this paper, however, there is a consensus within the studies that professional development should be based upon professional learning that is continuous, active, social and related to practice (Garet et al, 2001; Hopwood, 2015; Webster-Wright, 2009; Wilson & Berne, 1999). It is widely accepted that professionals learn through practice experience. The theoretical basis of this approach is underpinned by the work of American Philosopher, John Dewey and his views on the role of experience and reflection for learning. Dewey (1938) suggested that opportunities for reflective thinking were encouraged primarily by practical events that created feelings of disquiet or confusion or by a sense of wonder and awe. Being reflective requires active consideration about actions and their consequences and has a valuable role in supporting change. In addition, Lave and Wenger (1991) identified communities of practice as a sociocultural entity with an important role in supporting professional learning. In such communities, individuals share knowledge rather than just reflecting upon their own practice and develop ways of participating within their field or discipline. In doing this, the community shape their professional practice.

Government directives published in the late 1990s and early 2000s (DOH, 1998; DOH, 1999; DOH, 2000) set out an extensive agenda for change which brought into focus improving quality standards, efficiency, openness and accountability in the NHS through the implementation of national frameworks and standards. This focus upon competence standards has resulted in many professional development activities concentrating upon addressing content rather than the learning experience of practitioners (Webster-Wright, 2009). An outcome of this is that many professional development activities concentrate upon the need to update-knowledge and the learning of isolated competencies for practice. Webster-Wright (2009) argues for a reframing of professional development that moves away from this focus upon meeting standards and achieving measurable outcomes and the objectivist epistemologically stance taken in such programmes. When an objectivist stance is taken, knowledge is seen as something that can be transferred from teacher to student and
is primarily cognitive. Courses that focus upon the measurement of activities and outcomes to support CPD are not necessarily designed to acknowledge and embrace a social constructivist approach to learning or one in which practitioners are encouraged to experiment and take risks, make mistakes or adopt different approaches that take them out of their comfort zone. A creative learning approach, however, fosters social interactions and promotes active and reflective learning (Loi and Dillon, 2006). When the focus is shifted away from measuring defined outcomes individuals are empowered to be creative and embrace uncertainty – they are given opportunity to grow through experiences and to use their own creative abilities in activities that have meaning (Dewey, 1938).

Creative learning can be defined as ‘any learning which involves understanding and new awareness, which allows the learner to go beyond notional acquisition, and focuses on thinking skills’ (Ferrari et al, 2009). Unlike cognitive approaches, creative learning is learner centred and nurtures learner empowerment. Embracing innovative and novel teaching approaches has been demonstrated to foster creative learning through encouraging active and collaborative learning that is relevant to practice (Loi and Dillon, 2006). Utilizing creative experiential activities within a professional development course taps into both the cognitive and affective learning processes of practitioners. In this context, activities may be defined as a form of play in which they facilitate creative and cognitive processes including divergent thinking, mental transformations of existing ideas to new ideas, problem framing and evaluative ability (Mainemelis and Ronson, 2006). Play involves boundaries in time and space where the actual play is within a limited time and space in which normal social rules may be suspended and people do something they normally do not. Play or playful situations, particularly those that create positive safe experiences can foster creativity and enhanced cognition in individuals including improvements in learning and memory. The positive effects of play can be enhanced by the type of play in which an individual is involved and in particular physically active play seems especially useful in enhancing creativity and academic ability (Mainemelis and Ronson, 2006). The place or context in which learning takes place is an integral part of this learning journey. Therefore, the design of professional development activities, the relationships between the individuals involved, the activities undertaken and the place where the learning takes place need to be considered carefully to ensure that authentic professional learning occurs; maximising the learning opportunities to meet the needs and aspirations of each practitioner (Garet et al, 2001).

**Background to the study**
Biomedical scientists (BMSs) within the National Health Service (NHS) enter the profession with an undergraduate degree as well as having undertaken preregistration training in practice to allow professional registration with the Health and Care Professions Council (HCPC). BMSs carry out a range of laboratory and scientific tests that are essential in supporting the diagnosis and treatment of patients. In recent years, there has been a step towards extended roles for this group of scientists, to allow senior BMSs to perform more advanced tests and techniques normally performed by medically trained staff. This reflects the general increase in skill-mix occurring in other areas within the NHS, as recommended in various publications by the Department of Health (DOH, 2001; DOH, 2012).

Histopathology is a discipline within biomedical science which encompasses the diagnosis and study of diseases of tissues. It involves histopathologists (medics) examining tissues and cells under a microscope to enable a diagnostic report to be issued to assist clinicians in managing patients’ care. Specimen dissection is an essential first stage of this process and one of the most important stages in histopathology. The Royal College of Pathologists (RCPPath) issued guidance for the involvement of BMSs in specimen dissection in 2001; a role that has been traditionally performed by histopathologists. Following the RCPPath report defining this advanced role many histology departments in NHS Trusts introduced posts for BMSs that reflected these extended roles. The Institute of Biomedical Science (IBMS) is the professional body for scientists, support staff and students in the field of biomedical science. In response to the development of extended roles for BMSs the IBMS and RCPPath developed the Diploma of Expert Practice in Histological Dissection. The Diploma enables individuals to evidence the scientific and clinical knowledge that underpins the practice of dissection and the practical competence required to accurately dissect specimens. It is a professional vocational qualification assessed by completion of a portfolio of evidence and a written examination. A training logbook and portfolio of evidence are designed to provide a record of an individual’s training as well as evidence of regular assessments by a named consultant pathologist supervisor. The consultant assesses the BMSs competence in reporting the specimen types they dissect. Once the consultant is satisfied that training is complete, the BMS submits the training logbook and portfolio. Successful assessment of the portfolio by the IBMS is required for candidates to progress to sit a written examination (IBMS, 2019a).

In the context of the Diploma of Expert Practice in Histological dissection, developmental support for individuals undertaking this qualification should not only prepare them for the assessment but more importantly ensure that it fosters the growth of capable practitioners who are independent learners able to apply their knowledge expertly in everyday practice.
Specimen dissection requires critical and flexible thinking and problem solving when uncommon samples are encountered in the day-to-day workload.

**Context for this study**

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

**The study**

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

**Course development and design**

A participatory action research approach was drawn upon for this study with the expertise of each member of the team contributing to the development of novel and creative approaches to ensure professional learning was maximised for those attending the course. The course
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
setting allowed all teaching to be undertaken in one large learning space. This learning space supported course delivery since tutors could move from discussing the theory of dissection to demonstrating it and then allowing delegates to gain hands-on experience themselves. Not having to move between rooms or being restricted by scheduled timetabling and having all the resources in one place not only supported a more interactive approach but also a learner driven/learner centred one. Each tutor could easily adapt their delivery to meet the specific needs of the group.

Professional development courses are essential to develop practitioner confidence and to assist them to overcome any barriers they encounter in their practice. We wanted individuals to be able to develop their skills in a safe-space where they could be challenged but not have the worry of making mistakes that would impact upon patients. Safe-spaces can be established by developing relationships with students that are inclusive (Hockings, 2011), creating an environment where individuals feel at ease and able to participate fully without fear of ridicule (Arao and Clemens, 2013). We wanted to provide the delegates with as close to real-life experience as possible. The use of animal tissue was considered to support the development of certain skills, however, it would not allow us to recreate specific pathological conditions. We required an alternative approach that could simulate practice in the workplace. Simulation is now a key component of medical education with many procedures being taught using a range of different approaches to simulation (McGaghie et al, 2016). Simulation approaches range from high-tech virtual reality simulators, full-scale mannequins, plastic models, animal or animal products, and human cadavers, to screen-based systems (Sørensen et al 2017). Collaboration between members of the team supported creativity and encouraged thinking outside-of-the-box. This resulted in the design of activities that mimicked real-life specimen dissection. A range of simulated activities were developed that allowed delegates to master their knife skills, specimen orientation skills and dissection knowledge. Pasta, vegetables and mushy peas were found to be a suitable alternative to simulate both the shape and texture of clinical samples. Different food-based products and modelling clay were used to recreate scenarios that the BMSs may be exposed to in their dissection practice: from receipt of a skin excision sample to part of the large bowel with a tumour inside.

Delegates were asked to complete an evaluation survey at the end of each course to provide feedback on content, delivery, learning and teaching environment, as well as the appropriateness of pre-course information and general aspects of the course. The aim was to identify areas of good practice as well as areas for improvement to feed into the development of subsequent courses. In addition, in keeping with an action research
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The team met on a regular basis to reflect on their experiences and to discuss ideas to feed into the development of the course.

Delegate feedback from each iteration of the course was reviewed and evaluated enabling the team to draw upon the experiences and success of approaches. This informed development of the props used for simulation. By the third iteration of the course a range of different props had been developed that reflected the majority of dissection requirements and scenarios that practitioners would encounter. Course delivery became a more interactive and collaborative partnership between delegates and tutors with each iteration.

Educational design of the Specimen dissection course was therefore guided by the learning objectives/requirements of the award as specified by the professional body (IBMS 2019b) but more importantly by a creative approach to develop an appropriate learning environment to meet the needs of the learners.

A Likert scale was used in the course evaluation survey to obtain quantitative data providing feedback on delegates’ perception of their experience, from excellent to poor. In addition, free-text comments were also gathered allowing delegates to provide more personal reflections on the course. They were asked to provide feedback on each of the timetabled sessions, the general organisation of the course, the venue, and time allocations for sessions. In addition, questions were posed as to whether the course met their learning objectives or perceived developmental needs, what they enjoyed most about the course and finally suggestions for improvement. Thematic analysis of the free text responses was used. Open coding allowed us to develop codes describing, naming or classifying concepts within the free-text through the use of simple words or a short sequence of words.

Findings

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

![Overall assessment of the course](image)

*Figure 1 – Pie chart summarising delegate responses to the question ‘What was your overall assessment of the course?’ (n=17)*
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)*
Enjoyed the practical especially the neck dissection (Del 26)

The language used by the delegates such as ‘session with prostate’ and ‘especially the neck dissection’ suggests that although actual organs were not being used, the delegates saw these simulated dissections as the-real-thing – they didn’t relate it to the vegetable, pasta or modelling compound used. Additionally, the delegates were able to see how the skills they were developing supported their practice and were relevant to their development:

Inking experience was fun and really appropriate for the next stage in my development (Del 18)

The interactive and practical nature of course delivery ensured that delegates, all at different stages within their professional career, were able to gain something from the experience and relate it to their personal learning needs. The interactive workshop approach allowed a degree of autonomy for the delegates enabling them to learn and develop new skills or to improve upon their current skill set:

I am already experienced in skin dissection but enjoyed applying these skills within this module (Del 16)

This approach was seen to engender a feeling of being within a safe-space and one that supported confidence as a practitioner. Delegates commented upon the ‘friendliness’ (Del 2) of the tutors and that they were ‘approachable’ (Del 5) answering questions and providing supportive feedback on their skills. The session on dissecting gastro-intestinal specimens used pasta tubes to simulate this organ. Delegates commented that being able to practice a technique not only allowed them to apply what they had been learning but also built their confidence in their own ability as an advanced practitioner:

Really improved my background knowledge and therefore confidence when opening GI [gastro-intestinal] specimens (Del 28)

Being able to practice techniques without the fear of doing something wrong and so impacting upon a patient’s potential diagnosis and care enabled professional learning to take place but within a safe-space. The approach taken allowed individuals to experiment but without the potential consequences that could result from making errors in the clinical setting. This reduction in levels of stress as a result of being in a safe cognitive space fosters a deeper approach to learning (Khechara and Smith, 2018). Delegates could practice and refine their technique so building their confidence for practice. The creative approach adopted for learning dissection stimulated the development of new awareness (Ferrari et al,
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
extended beyond the time spent on the course. Such networks underpin continual professional learning and development (McArdle and Coutts, 2010).

Conclusion

The pedagogical approach adopted for the Specimen Dissection course provided BMSs with the opportunity to develop and refine their skills, repeatedly if necessary, using simulated activities without putting patients at risk. The approach offers unique opportunities for active, complex, and infrequent dissection situations to be practiced and managed. Human performance is strongly influenced by the situational context, and our findings demonstrate that the course design fosters interaction between the task, the environment, and colleagues, engendering learning for professional practice. The findings identify the need for further research into the role of creative learning and simulation not just within courses but throughout an individual’s training to support professional learning and mastery of skills required for practice. As biomedical scientists and other allied health professionals advance their roles and undertake the tests and techniques normally performed by medically trained staff, 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.

References


Overall assessment of the course

- Excellent = 89%
- Good = 11%
- Satisfactory = 0%
- Poor = 0%
Figure 2: Diagram illustrating the main themes identified through coding of delegates’ free text responses in the end of course evaluation questionnaire.