

# Pharmacy Education Conference 2018

## Manchester, United Kingdom

**Faculty of Biology, Medicine & Health,  
The University of Manchester, Oxford Road,  
Manchester, M13 9PT, United Kingdom**

### 01: Students' perceptions of a novel method to teach communication skills to M.Pharm. students

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**Background:** With the move to a patient-centred model of pharmaceutical care, pharmacists need to move from communication styles which focus on transmission of information to one that adopts a more consultative model (Sepucha and Ozanne, 2010; Kaae *et al.*, 2012; Murad *et al.*, 2014; Patricia Antunes *et al.*, 2015; Kerr *et al.*, 2017; Wolters *et al.*, 2017; Naughton, 2018). The M.Pharm. programme at the University of Strathclyde has partnered with Roleplay UK, a commercial organisation, to run workshops for students in the first three years of study. Communication trainers facilitate sessions using actor-led forum theatre: students redirect scenes containing patient consultations. Students learn about their own communication style before demonstrating how to flex this to communicate with others. In the latter sessions, students role-play consultations and interview situations with actors. This study was undertaken to evaluate students' perceptions of the workshops.

**Method:** Students answered open-ended questions online at the end of workshops from 2014-2018. All responses were imported into NVivo 11, where coding – open, axial, and selective – was performed to identify salient themes.

**Results:** Four hundred and sixty-eight students responded (response rate 42%): individual students may have responded to more than one questionnaire. Two themes emerged: (1) benefits and effective characteristics of the workshop, and (2) areas for improvement. Most students felt the workshop was helpful in teaching them verbal and non-verbal communication skills, and how to flex to different patient characteristics. The live scenarios, which facilitated active participation and application of skills learnt, were also useful as preparation for future roles as pharmacists. Immediate feedback was appreciated. There were requests for more varied scenarios involving different patient groups, and more opportunities to participate in the role-plays. Students requested smaller groups, which would encourage participation from those who were reticent, and allow more personal feedback.

**Conclusion:** Many current communication skills programmes are ineffective in equipping future pharmacists as they are didactic in nature, do not mimic real-world situations, and do not provide feedback to students. This model provides one example of an effective method.

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### 03: An evaluation of an M.Pharm. workshop exploring the needs of disabled service users

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**Background:** Funding of the M.Pharm. degree limits the provision of clinical placements and opportunities for experiential learning (Langley, Wilson & Jesson, 2010). At the University of East Anglia, an opportunity was identified to increase student exposure to service users in classroom time.

In consultation with the University's Expert by Experience committee, a workshop was designed to enable 4<sup>th</sup> year M.Pharm. students to engage with service users with individual needs relating to sight; speech; learning; and/or dexterity and mobility. Working in groups, students rotated through three workstations in 1.5 hours.

This evaluation explores the extent to which the workshop developed student understanding of service users' individual needs.

**Method:** Separate questionnaires were sent to all 85 participating students and five service users immediately following the workshop, *via* an emailed web link. Open questions were used to capture views on the workshop and how it could be improved. Opinions on how participation in the workshop may influence students' future practice were also sought. Content analysis was performed on the responses received (Bengtsson, 2016).

**Results:** Responses were received from 28 (33%) students and five (100%) service users.

Students enjoyed being "*able to listen and talk to real patients*" [Student 5] and having discussions which were "*not just focussed on medications*" [Student 3]. Service users commented favourably on student participation and respectfulness during the session and valued the opportunity to influence future practice.

Not making assumptions about capabilities and increased confidence in supporting patients with disabilities were the main learning outcomes for students. Service users also felt the workshops reinforced "*how important good communication is*" [Participant 5].

Students would have liked to have known more about the service users attending in advance of the session. There were contrasting views on optimal group size.

**Conclusion:** The feedback received suggests this is a useful approach to influencing students' future practice. Suggestions for improvement will be incorporated into future iterations.

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## 05: The mapping of pharmacy competency frameworks to M.Pharm. curriculum themes through the medium of posters

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**Background:** The Pharmaceutical Society of Ireland (PSI) Core Competency Framework (CCF) is the cornerstone of the PSI's programme to reform/inform training and education of undergraduate and practising Irish pharmacists (PSI, 2013). The design, content and pedagogical approaches within the University College Cork (UCC) M.Pharm. programme have been heavily influenced and extensively mapped to all CCF behaviours.

M.Pharm. students and faculty encounter challenges recognising where pharmacy themes such as patient safety and diabetes are located and taught across the curriculum and how they link to CCF behaviours.

The primary aim of this work was to help fill this knowledge gap by creating visually appealing, informative and systematically designed posters which map UCC M.Pharm. curriculum themes in a hierarchical manner to academic years, modules, modular activities and, ultimately, the CCF. (Zelenitsky, 2014).

**Method:** Data on curriculum components relevant to three M.Pharm. themes – patient safety, antimicrobials and diabetes – were collected by interviewing module coordinators and analysing both Blackboard® virtual learning environment (VLE) modular content and Book of Modules entries. Following data collection, landscape-orientated, A0 posters (one poster per theme) were designed to illustrate how each theme maps to the CCF *via* associated activities performed within modules. Posters were critiqued on their design, content and usefulness through five focus groups composed of M.Pharm. student year groups and pharmacy faculty. Thematic analysis of focus groups was subsequently performed.

**Results:** Both pharmacy students and staff found the theme-mapped posters intuitively straightforward to navigate, user-friendly and enhanced their understanding of the relevance and application of PSI Core Competency Framework in informing the design of their M.Pharm. curriculum. Four themes were identified from thematically analysing the focus group data: poster design, posters as teaching and learning tools, application of the poster design as a template for other M.Pharm. curriculum mapping studies, and student attitudes towards the CCF.

**Conclusion:** Student focus group analysis identified that CCF maps would be useful in increasing pharmacy student engagement and understanding with the PSI CCF. The chosen spider diagram-like poster design is readily adaptable to map pharmacy competency frameworks to other aspects of M.Pharm. modules, themes, experiential

placements, curriculum content and various pedagogical curriculum approaches. The mapping design developed in this work could also be used as a template for other healthcare and professional courses whose curricula are underpinned by a competency framework.

## References

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## 06: What is an integrated curriculum?

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**Background:** Schools of pharmacy in the Republic of Ireland have introduced five-year integrated pharmacy programmes. The rationale was that an integrated model is currently regarded as the optimum way of achieving a clearly defined set of educational outcomes to ensure the competence that underpins public and patient safety (Wilson & Langley 2010). Integration is challenging to define. It has been described as horizontal, vertical or spiral. Integrated curriculum processes might include experiential learning, team-based learning and case-based learning. Cross-cutting themes such as system-based teaching, stages of life might also be used. Harden describes integration as a complex continuum of 11 points with teaching unlikely to all occur at the same point (Harden, 2000). This scoping review asks: What is meant by integration in curriculum design for pharmacy education? We draw on the wider healthcare professions' education literature to inform the perspective in pharmacy.

**Method:** We followed scoping review methodology. Keyword searching was carried out in Ovid MEDLINE, EMBASE, Scopus, Web of Science and ERIC. Titles and abstracts were screened independently in duplicate by two authors. Research papers were eligible for inclusion if they contained details on curriculum integration in any healthcare professions' education. Title and abstracts were screened by two authors independently. Ten percent of included studies were data extracted independently by two authors.

**Results:** Five thousand, five hundred and ninety-four titles and abstracts, following duplicate removal, were screened for relevance. Four hundred and eighty-nine papers proceeded to the full text screening phase and 105

studies included at this stage proceeded to data extraction. Preliminary data synthesis has identified various integration designs, curriculum designs and teaching and learning methods relevant to curriculum integration. The level of integration has been classified, where possible.

**Conclusion:** Horizontal integration is the most reported, with a trend towards vertical or spiral curricula. The most common means of integration in health professions' curricula, and reflected specifically in pharmacy education, appears to be case-based learning and systems-based curricula.

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## 09: The use of a novel online phenomenon to disseminate public health messages to university students

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**Background:** 'Facebook Live' was investigated to disseminate a public health message to university students. The University College Cork (UCC) School of Pharmacy operate a Facebook page entitled 'UCC HealthVine'. Its goal is to spread public health messages to all UCC students and indeed, the wider online community. At a time when students can become increasingly sexually active, it is important to educate people on the importance of contraception (Bourke *et al.*, 2015). Research by Murphy-Lawless and colleagues (2004) reported that women find that dealing with contraception is "stressful and problematic". The aim of this pilot study was to explore the use of an innovative and interactive way of delivering contraceptive information.

**Method:** The Pharmacist provided explanations on the different type of contraceptive options over a 15-minute period via the medium of 'Facebook Live'. All 1,000 'UCC HealthVine' followers received immediate notifications informing them of the event. Viewers could message questions which were answered during the session. The data collected were from the available Facebook metrics (number of views, level of engagement *etc.*) in addition to the questions submitted by viewers. Thematic analysis of comments/questions posted by viewers was conducted.

**Results:** Engagement with the initiative was very positive generating approximately 12,000 views, 190 likes, 43 comments and 21 shares. Themes such as Travelling, Suitability and Co-morbidities arose from comments/questions.

**Conclusion:** This pilot project using the online medium 'Facebook Live' has proven successful in disseminating public health messages to the University audience. This novel initiative also provided a learning opportunity for the students involved in UCC HealthVine to use social media to engage with the public on healthcare matters. Further research is required to elucidate how using social media can be further developed to connect pharmacy students with the public but also to extrapolate its use into the teaching and learning of healthcare students.

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## 10: Understanding variations in registration assessment performance between schools of pharmacy

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**Background:** The General Pharmaceutical Council (GPhC), the independent professional regulator for pharmacists, is responsible for the national registration assessment. The GPhC publish registration assessment performance for each pharmacy school in Great Britain and this has been the focus of increased attention due to relatively large differences between the best and worst performing schools. The gap has widened from 21 percentage points amongst the best and worst performing schools in 2011 to 30 percentage points in 2014 (GPhC, 2015).

**Method:** The study investigates possible relationships between a range of publicly available data (University league tables and Unistats) and the registration assessment pass rate for different schools. The recently established pharmacy schools, Overseas Pharmacists' Assessment Programme (OSPAP) candidates and the September sitting were excluded, as their numbers were extremely small compared to M.Pharm. students (98%). The Pearson's correlation coefficient ( $r$ ) was calculated to explore the strength of the association between the variables. Values of  $r$  above zero demonstrate a positive correlation and higher values (proximity to +1.0) indicate the strength of the association.

## Results:

Area	Variable		Pearson's correlation coefficient
Assessment methods	Proportion of assessments that were:	written exams	0.306
		coursework	0.297
		practical exams	0.0107
Teaching methods	Proportion of time spent in lectures		0.120
Student satisfaction	National Student Survey		0.128
Entry qualifications	Mean UCAS tariff score		0.762

There were weak correlations between teaching methods, assessment methods, student satisfaction student/staff ratio and registration assessment performance but a much stronger correlation with UCAS tariff score was observed.

**Conclusion:** The correlations between anything that happened during the programme and pre-registration exam performance were weak but there was a stronger correlation between entry qualification and exam performance. It would appear that recruiting more able students is likely to have a greater impact on a school's pre-registration assessment performance rather than anything the school may do whilst the student is registered at the university.

## Reference

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## 12: Inter-professional Education (IPE) and professional identity: Can students' reflective writings measure professional development?

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**Background:** In recent years, healthcare educators have increasingly embraced the use of reflective writing to assess interpersonal and professional development among healthcare students (Charon *et al.*, 2016). Inter-professional education (IPE) is a key catalyst for professional development. Moreover, there is a significant association between professional development and reflective ability (Hoffman *et al.*, 2016). Thus, the main aim of our research was to investigate if M.Pharm. students' reflective essays following IPE activities could provide information on students' professional development?

**Method:** IPE-related reflective essays had been graded for a different assessment. We chose the essays from all range of grades to ensure they were representative of each cohort. Manual qualitative analysis of an anonymised sample of 35 M.Pharm. students' IPE-related reflective essays (7 Year 1, 14 Year 2, 14 Year 3) was undertaken for evidence of:

1. Understanding of the purpose and professional application of the IPE activities
2. Reflecting on own practice
3. Setting targets to develop own professionalism
4. Critiquing mainly focussed on the activities, rather than their own practice

Each category carried one point. We referred to the 2017 Standards for Pharmacy Professionals, General Pharmaceutical Council (GPhC), as the reference criteria to extract themes from students' reflective essays. Themes were coded according to the nine GPhC Professional Standards. Each essay was then scored by the researchers from 0 - 3 for each theme.

**Results:** Year 1 and Year 2 scored equally (33%) for Theme 3 'communicate effectively', whilst Year 3 essays scored 80%. Thirty six percent of Year 3 essays referred to demonstrating 'leadership skills', compared to 21% of Year 2 and 0% of Year 1.

**Conclusion:** Themes such as communication and teamwork featured across all three cohorts, suggesting IPE activities have inherent benefits from the outset. However, leadership did not appear in any Year 1 essays, but featured significantly by Year 3, which suggests some professional skills develop more gradually than others.

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## 14: Preparing the future workforce: Educating pharmacy students in GP practice

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**Background:** It is vital that pharmacy students entering professional practice should be able to work better with general practice as part of a multi-disciplinary and cross-sector team (RPS and RCGP, 2015). This opens up an ideal opportunity for GPs to ensure adequate training of pharmacy undergraduates to be facilitated in practices. The aim of this study was to test if the introduction of aspects of medicines optimisation to pharmacy undergraduate students further developed their understanding of medicines optimisation, communication, consultation and clinical skills in a general practice setting.

**Method:** This course was introduced to 22 final year (Year 4) M.Pharm. students in 2016. Approval for this educational programme to be evaluated was underpinned by the principles underpinning the institution ethical approval processes, as well as GP practice information governance processes which included data protection, full confidentiality of participant identity, patient data and patient consent. Seven GP practices in Leicester, Leicestershire and Rutland and Corby participated. Learning materials were prepared by GP trainers and academic staff. The course was delivered by GP trainers, practice pharmacists and academic staff. Using experiential learning and reflection techniques, students observed patient consultations with GPs, interviewed patients, conducted medication reviews, used medicines reconciliation techniques and produced pharmaceutical care plans. Students were asked to complete pre-course and post-course questionnaires. Feedback forms were completed by students and members of staff.

**Results:** Students scored eight learning outcomes on a scale of 1-5 (1=little understanding and 5=great deal of understanding). Wilcoxon signed rank test confirmed statistically significant median results between pre- and post-course questions with  $p < 0.05$  in all domains. Thematic analysis of student comments identified patient consultations as a positive experience and the staff survey reinforced added value with all reporting that they would engage in the process again.

**Conclusion:** This innovative 'proof of concept' programme has illustrated that pharmacy undergraduates have experienced the positive value of developing and understanding clinical skills underpinned by evidence based practice in a general practice setting. Students have had a successful introduction to the general practice environment which will support the development of future undergraduate pharmacy programmes as part of Primary Care Integration agenda.

## References

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## 15: Health and Lifestyle clinics in community pharmacy: A pilot placement for pharmacy undergraduates

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**Background:** A Health and Lifestyle placement was piloted in 2016-17 with Year 2 pharmacy undergraduates. Students used the consultation area in a community pharmacy to have a conversation with walk-in patients, structured around a custom developed template. Students captured information on blood pressure, height and weight, arm and waist circumference and lifestyle. Education was provided to patients using information and support resources from literature, on alcohol, diet, smoking cessation and exercise (BHF, 2018). A pharmacist supervisor was available on-site, but consultations were completed without direct supervision. The aim of this project was to evaluate the students' perceived educational benefit of the pilot.

**Method:** The placement was offered to all 2<sup>nd</sup> year students (n= 104) as a choice of role-emerging placement opportunities. Pre-placement sessions were held to support the students prepare for the placement's learning outcomes. Students attending a placement were required to submit a reflective account of it upon completion of the placement (Deslandes *et al.*, 2017). Students provided consent for their anonymised reflective accounts to be used for research. Thematic analysis was undertaken on student reflections.

**Results:** Twenty-four students attended the placement, and all submitted reflective accounts were used for analysis. All participating students enjoyed the placement and stated that it contributed to their professional development. Four main themes emerged: developing confidence, patient receptiveness, communication with patients from different backgrounds, person-centred care. Students appreciated the use of the tailored template and commented on the potential value of including a more structured approach to discussing perceived sensitive topics in pre-placement preparation workshops.

**Conclusion:** The placement was accepted as beneficial and rolled out to the whole 2<sup>nd</sup> year cohort in the following academic year. Added pre-placement preparation included practice on Making Every Contact Count (MECC), a structured approach to behaviour change that supported students to empower patients to make changes to their lifestyle (MECC, 2018).

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## 16: Introducing scenario-based videos to aid interest of pharmacy law

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**Background:** Pharmacy law is essential to pharmacy practice and integral to pharmacy teaching. It is mainly taught didactically. (Gallagher, 2011). As we live in a 'digital era', it is important to introduce new technological formats for students to learn and/or study from (Gurvitch & Lund, 2014). The study aimed to investigate participation in and perceived usefulness, and future opportunities with created animated videos in pharmacy law teaching.

**Method:** Using Videoscribe software, animated scenario-based videos (n=9) on various pharmacy law topics were created and shown to students in relevant lectures and workshops plus were made available online. The target participants were Level 5 M.Pharm. students (n=135) participating in the Law and Ethics module at a university. A questionnaire was created consisting of 23 questions using 5-point ratings and Likert scale, free text and dichotomous questions. The questionnaire was analysed using descriptive statistics and word counts.

**Results:** Response rate was 77% (104/135). Of these, 79% (n=82) had watched at least one video with 48 (59%) having watched all nine. 'Emergency supply at the request of a patient' was most watched with 'Safeguarding' watched the least. For perceived usefulness, 'Legal requirements of prescriptions' was most useful (mean: 4.34/5) and 'Patient Group Directions' least useful (mean: 3.06/5). Of 89 responses, 73 (n=82%) intended to use the videos for revision. Almost all (98%, n=86/88) agreed that content of the videos was relevant to pharmacy law. Future topics wanted included calculations, BNF use, requisitions and Medicines Use Reviews (MURs).

**Conclusion:** Videos are well received as a methodology for supporting learning, with content seen as relevant and useful to supporting the teaching of pharmacy law, although impact on performance has not been assessed. When given opportunities to support learning, students are seen to embrace these. Creating additional videos and resources for students needs to be further explored to increase understanding and engagement in topics.

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## 17: Simulated learning in a mock ward setting: A tool for developing clinical knowledge, improving patient safety and inspiring future hospital pharmacists

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**Background:** Traditional didactic teaching and learning methods can provide fundamental knowledge, but do not develop the clinical skills that are required to apply knowledge to complex, patient-focused scenarios. Simulated learning sessions have been successfully implemented as a tool for developing the required skills in a safe and realistic setting (Aggarwal *et al.*, 2010). Recent investment at the University of Sunderland provided the creation of four purpose built mock wards each replicating the clinical environment of an acute hospital setting.

**Aim:** To explore the perceptions of pharmacy students towards simulated learning as a tool for developing clinical knowledge and stimulating an interest in hospital pharmacy.

**Method:** A series of simulated learning sessions were delivered to Stage 3 pharmacy students; students participated in mock ward rounds and sessions utilising SimMan® 3G technology. A particular focus was directed towards patient safety and the safe prescribing of high risk drugs, such as insulin and opioid analgesics. A qualitative evaluation was performed, consisting of a focus group with a representative sample of eight students.

**Results:** Students perceived simulated learning to have improved their retention of knowledge and their ability to apply concepts to the care of patients. Students reported that the sessions required them to adapt to unfamiliar and challenging situations; a skill which will be beneficial for them in practice. Following the sessions, a number of students expressed a desire to pursue a career in hospital pharmacy.

One of the key observations made was the high level of engagement in the simulated ward sessions compared to traditional classroom activities; the interactive nature of the sessions facilitated a higher level of discussion around key topics.

Students highlighted the potential benefits of increasing the number of interactive resources in the sessions; further utilisation of SimMan® 3G and additional facilitators, such as nursing staff, medics and patients could enhance the realism of the simulation.

**Conclusion:** Students perceive that simulated learning can enhance knowledge retention and develop the ability to adapt to challenging situations. Simulated ward activities can be utilised to develop aspirations towards a career in hospital pharmacy.

## References

Aggarwal, R., Mytton, O.T., Derbrew, M., *et al.* (2010). Training and simulation for patient safety. *BMJ Quality & Safety*, **19**, i34-i43

## 18: Life in 3D: a different approach to teaching anatomy to pharmacy undergraduates

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**Background:** Modern pharmacists need a thorough grounding in anatomy and other basic sciences. Traditional teaching presents a challenge as organs are 3D in nature; their structure and connections to other tissues are not easily illustrated by 2D graphics. Traditionally anatomy is taught through cadaver dissection however time constraints, a lack of material and rising costs mean that alternative methods for teaching anatomy are required (Papa & Vaccarezza, 2013).

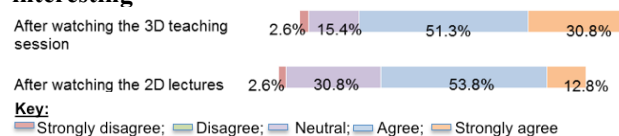
Virtual reality (VR), augmented reality (AR) and 3D learning environments have added to the range of educational technology available (Kamphuis, 201; Craig & Georgieva, 2017; Moro *et al.*, 2017). 3D visualisation technology (3DVT) is already in use in the physical sciences, and an increasing body of evidence suggests that this technology has benefits for the pharmaceutical sciences and medicine (Brazina *et al.*, 2014, Peterson & Mlynarczyk, 2016). There is a need for further evaluation if the pedagogical effectiveness of 3DVT in pharmaceutical science education is to be fully understood

Students engage better and improve their learning and problem solving abilities when technology is used appropriately and effectively. In this study, the impact of 3DVT on student engagement with the anatomy content was examined using a mixed methods approach.

**Method:** The study took place over one academic year and involved students in their first year of study; students experienced anatomy teaching using traditional 2D materials (lecture slides) and then in 3DVT. Student understanding, engagement and enjoyment of the material was evaluated with the use of a five point Likert questionnaire, followed by focus groups to gain a better understanding of the student experience with 3DVT.

**Results:** Data from the questionnaires indicates that a greater percentage of students found the material interesting when it was delivered using 3DVT compared with 2D graphics (Figure 1), with 30.8% strongly agreeing with the statement compared with 12.8%.

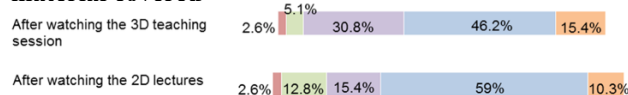
**Figure 1: Students found the material covered interesting**



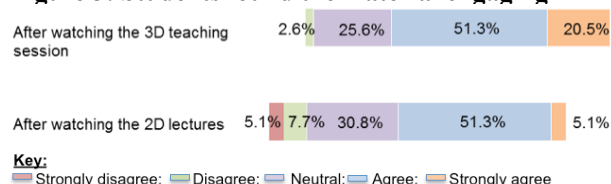
Students felt that their understanding of the material also improved with the use of 3DVT (Figure 2) however this was shown by a reduction in the percentage of students who disagreed (5.1% after 3DVT compared to 12.8% after 2D) and an increase in the percentage of students selecting the neutral option (30.8% compared with 15.4%). When asked to rate their engagement with the

material there was a shift towards the agree/strongly agree end of the scale, with no students selecting strongly disagree, and a fourfold increase in those responding strongly agree (Figure 3).

**Figure 2: Students felt that they fully understood the material covered**



**Figure 3: Students found the material engaging**



From evaluation of the focus group data six clear themes emerged which could be split into three over-riding categories of technology use, student focused, and environmental. Comments were very positive, students highlighted the benefits of the 3D technology to visual learners stating that it helped them to understand the locations, size and relation positions of organs in a way that the video lectures were unable to do.

**Conclusion:** 3DVT is potentially a valuable addition to anatomy education in pharmacy; the results from this study suggesting that 3DVT provides a new and interesting way in which anatomy education may be delivered, without the need for cadaveric dissection. With the recommendation in 2018 that a formal anatomy syllabus for pharmacy be considered, further work is planned to evaluate the benefit of 3DVT in terms of academic achievement when compared with traditional 2D forms of presentation.

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## 19: The value of peer observation between healthcare professionals in an acute trust - a pilot project

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**Background:** Peer Observation (PO) is peer review within teaching practice. Colleagues observe each other's practice enabling feedback and discussion, promoting reflection and identify areas for improvement (Finn *et al.*, 2011). Within educational and clinical settings PO could facilitate improvements in aspects of practice, facilitate inter-professional education (IPE) through different healthcare professionals (HCP) learning from each other's practice and ultimately support trainees and patient care. This pilot was designed to evaluate PO within an acute hospital with respect to Health Education England Quality Framework (HEE, 2016).

**Method:** Voluntary participants were recruited through an Acute Trust multi-professional education forum. Observers required prior experience of PO while practice educators/teachers were required to have teaching as an integral element to their role. Focus groups and online piloted questionnaires were completed to obtain qualitative and quantitative data from each participant group. Data were analysed according to the principles of thematic analysis (qualitative data) and descriptive statistical analysis (quantitative data). All data were amalgamated into a cohesive narrative in order to answer the aim and objectives.

**Results:** Five peer observers, nine practice educators volunteered from a range of HCP including pharmacy, nursing, transfusion practitioners clinical librarians, research officers, and lead for Multi-professional Education. Overwhelmingly positive attitudes were reported by observers and those being observed. Perceived benefits of both groups included acquirement of new teaching skills from the experience, enhanced of professional development and learning from a different HCP and recommendations of PO to be undertaken annually.

**Conclusion:** PO is a valuable experience, increases awareness of other healthcare disciplines and facilitates IPE. It has positive implications for personal development which contributes to improved education practice and compliance with healthcare education regulatory standards. This ultimately positively impacts on patient care and trainee experience. Recommendations were made for the implementation of a routine peer observation programme within a multi-professional healthcare setting.

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## 22: Poster presentations are effective continuous assessment activities to foster integrated learning by undergraduate pharmacy students

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**Background:** To foster pharmacy student teamwork, communication and presentation skills, and to facilitate integrated learning, a successful, drug-themed, team poster continuous assessment element was introduced within the third year of the UCC M.Pharm. curriculum.

The objectives of the poster activity were to:

- Enable pharmacy students to communicate, in an integrated manner, through the medium of an A0, portrait-orientated poster, the chemistry, formulation, pharmacology, and clinical pharmacy of a specific drug.
- Foster student teamwork and presentation skills.
- Empower student expression of their multiple intelligences.
- Develop student skills in lifelong learning with emphasis on the integration of knowledge.

**Method:** Module PF3009 pharmacy students were divided into four-membered teams, assigned a PF3009-related drug and provided with poster design training. Teamwork training included a visual thinking strategy-type exercise using art exhibits in the UCC Glucksman Gallery. Teams were given eight weeks to plan, develop and produce their posters.

The poster activity culminated with a Poster Afternoon where each student team presented their posters to UCC Pharmacy and non-Pharmacy faculty in an environment akin to a conference-type poster session. UCC faculty graded each team using a rubric which focused on poster design, content and team-assessor engagement. In addition, students graded each member of their own team under various headings such as team conflict, team contribution and ability of team members to work as part of a team. The teamwork feedback e-tool known as CATME (CATME, 2018) was used to capture the student-generated grades.

**Results:** Team posters are a surprisingly effective and fun means of encouraging pharmacy students to integrate knowledge through a creative and visual medium. Students enjoyed interacting with pharmacy faculty in a one-to-one conversational manner in contrast to more formal assessment methods. The exercise is mappable to an advanced rung of Harden's Integration Ladder (Harden, 2000). In addition, many diverse competencies of the Pharmaceutical Society of Ireland Core Competency Framework for Pharmacists (Pharmaceutical Society of Ireland, 2013) are mappable to the poster exercise, including 'health promotion', 'provides medicines information and education', 'research skills', and 'workplace management skills'. The CATME student peer-evaluation e-tool afforded a successful mechanism of elucidating team member contributions for individualising student grades.

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## 25: Evaluation of a joint collaboration between Acute Trusts and a local pharmacy school to deliver Health Education England London and the South East Objective Structured Clinical Examinations practice questions for Pre-Registration Trainee Pharmacists trainees

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**Background:** Pre-registration Trainee Pharmacists (PRP) on London and South East (LaSE) programme complete a formative OSCE. In preparation, practice work place OSCEs should be delivered. LaSE had developed practice stations with an accompanying guide to assist with organisation and ensure PRPs were familiar with the format, expected standards and marking criteria. Awareness of benefits and resource implications in terms of organisation, staffing and rooms (Smee, 2003; Robbie *et al.*, 2006) led to a local collaboration between two Trusts and a School of Pharmacy (SoP). The aim was to evaluate the PRP event experience.

**Method:** SoP facilities were utilised, including video equipment allowing trainees' performance filmed. Actors and assessors were from SoP and local Trusts. PRPs were briefed to build on prior OSCE experience. Directly after the OSCE a feedback session to review stations and concerns was held. PRP evaluation used the standardised LaSE event questionnaire for quantitative data and qualitative data. Responses were analysed using Excel 2013.

**Results:** Ten PRPs attended. All (100%) completed the evaluation form. They highly ranked the organisation of the day, achievement of learning outcomes, suitability of the venue, increase of knowledge, and the event meeting expectations. Comments included: "It was stressful in a good way as it allowed me to analyse my learning needs and further apply them to practice"; "OSCEs were impressive in that they were well organised with lots of feedback"; "The stations were set up well and I feel it was a good idea to do a practice".

**Conclusion:** Joint collaboration between acute Trusts and SoP supported the preparation of a formative PRP OSCEs. Positive feedback highlighted how feedback aided the recognition of individual training needs. Further work is needed to evaluate benefits of filming and compare practice results to the LaSE formative OSCE. This model could be rolled out to more Acute Trusts and SoPs.

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## 26: How a behaviour change learning activity engaged pharmacy undergraduate students with health psychology theory

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**Background:** Pharmacists are particularly well placed to promote health and self-care. It is therefore important that undergraduate education prepares future pharmacists for their role in supporting the lifestyle behaviour of patients and the public (Department of Health, 2005). Health psychology and the principles of behaviour change are a part of the indicative syllabus (General Pharmaceutical Council, 2011). However, teaching undergraduate healthcare students about behaviour change models is challenging. Students often have little prior experience and the relevance to their future practice may not be immediately apparent.

This study aimed to design and deliver a novel approach to teaching behaviour change principles to undergraduate pharmacy students in one School of Pharmacy, and to capture their reflections on the learning activity.

**Method:** All second year pharmacy students in one university (n=99) were asked to choose one behaviour to change. An anonymised diary was used to record their behaviour for one week before and after a behaviour change models lecture, including health belief, trans-theoretical, COM-B models, theory of planned behaviour and health locus of control. Ethics approval was granted.

**Results:** Of the 99 students (72% female; aged 19-25yrs; all 'home' students), 61 completed the exercise (62%) and 55 (90%) made their proposed change. Behaviour was categorised into themes: exercise (n=21), diet (n=20), liquid consumption (n=14) and other issues such as social media use (n=6). Students provided plans, barriers and

motivators to change, including how the activity had raised awareness of their own beliefs and relevance to practice. Reasons for not changing (n=6) were documented, where relevant. Ten (16%) noted the theory which best described their behaviour (health belief (n=4), trans-theoretical (n=2), COM-B (n=1) models, theory of planned behaviour (n=2), health locus of control (n=1)).

**Conclusion:** This novel learning activity was successful in engaging two-thirds of the pharmacy student cohort with a real-life experience of behaviour change and appreciating its relevance to pharmacy practice.

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## 27: The prevalence, ethics, and behavioural aspects of cognitive enhancer use in pharmacy and nursing students

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**Background:** Student cognitive enhancer (CE) use in the United Kingdom (UK) ranges from 0.4% to 9.4% (Holloway & Bennett, 2012; Singh *et al.*, 2014), although higher rates of usage have been reported in the media. We aimed to assess the life-time prevalence, attitudes, and ethical beliefs among healthcare students towards CEs.

**Method:** A quantitative self-completed survey was developed, following Singh *et al.* (2014), to allow comparison. The survey was piloted with six pharmacy students and an academic tutor, then revised. The survey was hosted at Bristol Online Survey and distributed to 411 pharmacy and nursing students.

IBM SPSS v22.0 was used for analysis. Ethical approval was obtained from the School of Pharmacy's ethics committee.

**Results:** Forty-two percent (179) of students responded (nurses = 92, pharmacy = 87). Half of the respondents had heard of CEs, with pharmacy students being seven times more likely to be aware of CEs than nursing students. Life-time prevalence of CE use was 2.8%. Modafinil was the most commonly used drug (n=4); all users reported adverse drug reactions. 14% of students reported they thought they knew a student using CEs;

7.8% reported they knew someone using CEs. Thirteen point four percent of respondents expressed interest in trying CEs.

7% of students agreed that use of CEs should be treated the same as coffee use. Forty-four percent of students opposed drug testing for CEs in students. The same proportion of students (1.6%) agreed that doping in sport or cheating in examinations was ethically acceptable. 62.8% of students “uninterested in CE use” agreed CEs were ethically equivalent to cheating in examinations, compared to 41.7% of “interested students”.

Historic or current use of recreational drugs (17.3%) was associated with a 9-fold likelihood of interest in CEs,  $\chi^2$  (1, N=151) = 23.26,  $p < 0.001$ .

**Conclusion:** Despite low life-time prevalence, student interest in CEs exists. Interest in CEs appears to be associated with novelty seeking behaviours (such as recreational drugs). Students over-estimate peer use of CEs.

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## 28: Evaluation of an integrated approach for delivery of an extemporaneous dispensing course

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**Background:** The role of the pharmacist continues to evolve, with a growing clinical aspect and more patient contact (General Pharmaceutical Council, 2011). However, the acquisition of scientific skills must not be offset by the increased clinical content. This challenge is further compounded by reports of disillusionment from United Kingdom (UK) pharmacy students in the early years of the course, due to a heavily-weighted science-based component (Jesson *et al.*, 2006). Extemporaneous dispensing, at an early stage in the M.Pharm., provides an appropriate platform to marry these disciplines in a bespoke manner. The aim of this study was to determine the views of students of this integrated practical course.

**Method:** A questionnaire methodology was used to determine student (n=110) views on extemporaneous dispensing. The questionnaire sought views on areas such as relevance of the subject and usefulness of various teaching & feedback methods employed. Quantitative data were analysed using SPSS (v22). Content analysis

was used to evaluate free text responses. The study has received ethical approval from The School of Pharmacy Research Ethics Committee.

**Results:** A total of 105 students completed the questionnaire (response rate=96%). Formative practicals, online videos and the course manual were teaching methods favoured by students. Free text comments also highlighted the value of innovative methods such as video demonstrations. Students valued the feedback with 81% of respondents rating individual feedback as beneficial or very beneficial. A majority of students (89%) strongly agreed or agreed that adequate training had been provided in relation to extemporaneous dispensing.

**Conclusion:** This study highlights an example of how science and practice have been successfully embedded, in an integrated manner, at an early stage of the M.Pharm. programme. Feedback from students suggests the wide range of innovative methods employed in this integrated course is conducive to their learning and progress. Results of this project will further help inform teaching of this topic and other modules.

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## 29: Using learning communities for the leadership development of pharmacy professionals

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**Background:** There is a need for the pharmacy profession to establish strengthened leadership skills required to deliver extended roles and new models of care. Traditionally pharmacy professionals access leadership development which is normally sector specific.

**Method:** CPPE, HEE Yorkshire and Humber & Community Pharmacy West Yorkshire designed a six-month Leadership Development Programme for pharmacy professionals who have been qualified for at least two years. It is aligned to the NHS Healthcare Leadership Model (NHS Leadership Academy, 2018) and the RPS Leadership Development Framework (Royal Pharmaceutical Society, 2015) with emphasis on development of leadership behaviours. Protected time and venue away from work facilitates space and time to reflect on leadership behaviours. A work based project allows individuals to demonstrate the learning they have gained.

The course starts with a full study day followed by five learning community sessions; each group has five members, allowing learners the opportunity to facilitate a session. There is a one hour facilitated action learning style approach to the project work, to provide support for project and leadership development.

**Results:** This multi-sector leadership education experience has been widely acclaimed as a positive force to drive improvements in person centred care in the NHS through enhanced leadership skills.

The format of the learning communities has facilitated cross sector networks, which have continued beyond the course and each individual has produced a project which has improved patient care.

There are examples of participants who have developed to the extent that they commenced new leadership roles.

We are currently nearing the end of cohort two, with pharmacy professionals utilising the leadership skills they have learnt to drive change in their projects.

**Conclusion:** Personal development is difficult to measure but the cross sector community for learning has inspired a shared purpose and reignited a passion for pharmacy.

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### 30: Exploring digital teaching tools, including the use of social media, to support teaching; perspectives of M.Pharm. students

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**Background:** The School of Pharmacy and Medical Sciences, University of Bradford, is keen to evaluate the potential benefits of digital tools to enhance the teaching and learning of all M.Pharm. students. Students are increasingly using digital technology for both educational and social purposes (Cheston *et al.*, 2013). This project explored the views of pharmacy students about digital technology, including social media, for teaching in the M.Pharm. programme.

**Method:** Convenience sampling was employed to recruit M.Pharm. students for focus groups. Each focus group, facilitated by student researchers with topic guide, was audio-recorded and analysed for themes. Ethics approval was obtained from the University.

**Results:** Year 2 and 3 students from two focus groups (n1=8 (6 male), n2=10 (8 male)) identified three main digital teaching tools used in the current programme: Blackboard, response clickers, and iSTAN. Blackboard, a virtual learning environment, was seen as a hub for holding all required learning materials. However, its use depended on internet access and some felt they would benefit from offline use and improved compatibility with different devices. Audience response systems and a human patient simulator were well received by students. However, participants strongly felt that they were under-utilised.

The main benefit of using social media for learning was instant feedback and the encouragement of informal discussions. Participants were not always comfortable posting within the current digital tools used in the programme (*e.g.* Blackboard) as they felt 'monitored'. However, participants acknowledged that information obtained through social media might not be as reliable as information from digital tools moderated by academics. Interestingly, participants reported a lack of engagement with programme specific social media pages (*e.g.* Facebook page). They felt that the information provided was aimed at qualified pharmacists, rather than current students.

**Conclusion:** Participants valued accessibility, flexibility and availability of instant feedback when using digital tools to support their learning. They felt positive about the digital tools used within the programme but emphasised the need of greater integration.

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### 31: Exploring the use of digital technology in the M.Pharm. programme to prepare students for their first day of practice

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**Background:** Technological developments have facilitated the storage of patient records, enabled electronic prescribing, dispensing and the administration of medicines (Goundrey-Smith, 2014). These innovations are increasingly being used, requiring pharmacists to further develop digital capability. The School of Pharmacy and Medical Sciences, University of Bradford, is keen to explore ways to better equip M.Pharm. graduates with the necessary skills to confidently practise in the modern digital environment. This project explored student and staff perspectives of current digital teaching tools in relation to preparedness for the first day of practice.

**Method:** Two focus groups M.Pharm. students (n=7) and staff (n=7), recruited using convenience sampling, were facilitated by student researchers. A topic guide, focusing on the perceived value of digital technology used in the programme, was used. Discussions were audio-recorded and analysed for themes. Ethical approval was obtained from the University.

**Results:** Participants discussed technology used in the programme to prepare students for their first day of practice. Clinical skills suite (e.g. using patient medication record software) and the use of online professional resources were felt to be a useful introduction to the workplace. Whilst the students found a human patient simulator engaging, they suggested that different approaches such as virtual patient avatars to practise consultation skills and clinical decision-making could improve their preparedness further.

It was suggested that implementation of electronic prescribing systems in the clinical skills suite could better equip the students for a paperless workplace. Students additionally felt that the technical difficulty with digital technology and level of challenge did not increase as they progressed through the programme.

**Conclusion:** Whilst students and staff felt that some of the technology used within the programme needs modernising to reflect current practice (e.g. electronic prescribing), staff agreed that the overarching digital skills required to use any technology in practice could be acquired. A technology spiral within the programme, where students' digital literacy is progressively challenged and reinforced, could build confidence for their first day of practice.

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## 33: The effect of case-based learning on students' learning and skills development: Perceptions of fourth-year pharmacy students

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**Background:** Concerns have been expressed about trainee pharmacists' confidence, communication and decision-making skills; and their ability to integrate learning with practice (Guile & Ahamed, 2011). Case-based learning (CBL) aims to foster knowledge

integration and the development of various skills through the use of clinical cases and enquiry-based learning methods (Nelson, 2010). Pharmacy students at the University of Wolverhampton experience CBL extensively during the third and fourth years of the programme. This study aims to explore the perceptions of fourth-year pharmacy students on the effect of CBL on learning and skills development.

**Method:** A paper-based semi-structured questionnaire was offered to students for completion during a timetabled session. 'Tableau', a software that builds clear and interactive visualisations of data was used to represent the five-point Likert scale data. Furthermore, a thematic analysis was conducted on the open responses.

**Results:** A response rate of 75% (N=54) was achieved. The overwhelming majority of students reported an improvement in their ability to identify and evaluate their learning needs, (91%, N=49 and 78%, N=42 respectively). The students also felt that they were better at interpreting medical notes (80%, N=43) and identifying drug and non-drug problems (74%, N=40). The highest rate of agreement was recorded for statements relating to the integration (91%, N=49), application (87%, N=47) and retrieval of knowledge (87%, N=47). An improvement in personal confidence and interpersonal communication skills was reported by 80% (N=43) and 78% (N=42) of students respectively. Fewer students felt that their time management skills improved (43%, N=23). Some students described CBL as an "innovative", "enjoyable" and "highly effective method of learning". Additionally, some students favoured CBL over lectures and team-based learning. Student criticisms were mainly related to attendance, group size, team member contribution and support from facilitators.

**Conclusion:** Fourth-year pharmacy students at the University of Wolverhampton are largely satisfied with their CBL experience and feel that CBL enhances their learning and develops their skills. In order to maximise and maintain the benefits gained from CBL, changes may be required to improve student attendance and time management skills; and further develop facilitation.

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### 34: Bone health programme: A proactive population approach to bone health

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**Background:** The programme aimed to improve health outcomes for patients at risk of sustaining a fragility fracture and promote improvements in bone health through education, targeted case finding, effective treatment and medication compliance.

**Method:** The programme was delivered by a multi-disciplinary team, with pharmacists working alongside clinicians to determine the criteria for cohorts to be clinically assessed and to encourage shared learning.

Data was collated to identify the at 'risk populations' and opportunities to improve their treatment. Detailed reviews were conducted, and interventions were implemented and communicated to patients.

**Results:** Of the 258,000 patients assessed, 110,643 required a fracture risk assessment and were assigned a FRAX score. Eight thousand and forty-four patients (7.3%) had a > 20%, ten year probability of a major osteoporotic fracture.

The NOGG interpretation graph was utilised to further stratify patients, with 2,890 patients requiring treatment - only 23% of these patients were currently receiving bone sparing therapy.

Within the treatment cohort:

- approximately 50% of patients were untreated and/or had no previous evidence of bone health assessment, leading to an estimated 140 hip fractures at a direct hospital cost of almost £2.3million;
- with effective treatment, a reduction in hip fracture incidence of circa 40% could be achieved (Cochrane 2008)<sup>1</sup> delivering a net saving of circa £0.9million and avoiding 56 hip fractures as well as innumerable low trauma fractures.

**Conclusion:** Adoption of national guidelines and improvements in bone health through a range of non-medical and medical interventions can be achieved at scale but requires collaborative working between all stakeholders to deliver optimal outcomes.

This example of collaborative working was an opportunity to establish processes, educate and up-skill pharmacists and the wider multidisciplinary team to support sustained quality improvement in the management of patients with osteoporosis.

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### 36: An evaluation of an M.Pharm. workshop aimed at preparing students for responding to minor ailments within the workplace and within assessments.

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**Background:** The current funding model of the M.Pharm. degree limits the opportunities for students to develop key skills within the working environment (Langley *et al.*, 2010).

University of East Anglia students are assessed on their ability to respond to symptoms within an OSCE. Anecdotal feedback has consistently suggested students find this challenging. An opportunity was identified to allow Year 3 students to develop their responding to symptoms skills within a simulated environment, rotating around simulated patients presenting with a variety of conditions.

This evaluation explores the extent to which the workshop supported skills development and preparation for practice.

**Method:** An online questionnaire was made available for students to complete following the workshop. The questionnaire consisted of three closed questions using a Likert scale. Open questions were used to capture opinions on how the workshop had been of benefit, would impact on future practice and how the workshop could be further developed. A thematic analysis was conducted on written responses (Braun & Clarke, 2006).

**Results:** One Hundred and twenty students participated in the workshop; of these 25% completed the questionnaire. Ninety-three percent stated that the workshop increased their confidence, 96% felt it helped them to prepare for the assessment and 79% felt that the scenarios were representative of the situations which might be encountered within a community pharmacy.

Students commented that they benefited from the fast pace of the workshop and the fact that a number of conditions were covered in quick succession. They also welcomed the use of simulated patients and having no preparation time which aligned it more closely with community pharmacy practice.

**Conclusion:** The feedback received suggests that this is a useful approach both to aid the students' preparation for assessments and expand their exposure to situations which they may encounter in community practice. The workshop will continue to be used in subsequent years with further evaluation being completed following any revisions.

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### 37: Virtual reality training to meet the challenge of low adherence through improved shared decision-making

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**Background:** Fifty percent of patients do not take their medicines as prescribed which can lead to a failure to achieve the full therapeutic effect. To remedy this, there have been recent calls to improve pharmacists' abilities to practice shared decision-making with their patients. We set out to design and build an interactive, virtual patient simulation that a pharmacist could use on their laptop or tablet to practice conducting evidence-informed, shared decision-making with a patient.

**Method:** The design process for the virtual patient was multi-stage; initial scripting, involvement of real patients, expert review and digital creation. The resulting design was then piloted with academic clinicians from both the School of Pharmacy and School of Medicine, University of Keele, using pre- and post-simulation questionnaires, mixing both qualitative and quantitative data; qualitative data was analysed thematically.

**Results:** The resultant Virtual Patient included both high fidelity animation and autonomous feedback and is accessible via a web-link. Eighteen participants (14 pharmacy, 4 medicine) completed the evaluation. Eighty-nine percent of participants (n=16) rated the simulation as either "Enjoyable" or "Highly Enjoyable". Ninety-four percent of participants (n=17) suggested the simulation was either "Accessible" or "Very Accessible". Half of the participants (n=9) felt that it was either "Likely" or "Highly Likely" that there would be changes in their practice. Thematic analysis of the free-text responses suggested that this change was a shift towards a more patient-centred consulting style.

A theme of 'restricted interaction' was constructed from the qualitative data.

**Conclusion:** With easy accessibility and an enjoyable nature, the data from this pilot study suggested that the virtual patient could be a viable way for one to practice interacting with patients. Further work is planned with pharmacy students as well as medical professionals.

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### 42: Sharing inter-professional perspectives for safe prescribing: Medical and Pharmacy students analyse hospital patients' medications for safety, adherence and optimisation

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**Background:** Prescribing errors remain a continuing patient safety concern. Eradicating errors in prescribing requires closer working between doctors and pharmacists to manage challenging polypharmacy issues for patients with complex co-morbidities; especially for the ageing population (Duerden *et al.*, 2013). Safe prescribing requires inter-professional decision-making using a holistic patient-centred approach (NICE, 2015).

**Aims and Objectives:** We aimed to demonstrate that amalgamating the knowledge and skills of medical and pharmacy students and supporting their learning in practice can offer a platform to enhance their attitudes and values for inter-professional working and safe prescribing. This brief inter-professional education programme (IPE) included senior undergraduate pharmacy and medical students. Working inter-professionally together with patients, students analysed complex prescriptions for safe prescribing, and used learning materials, including the STOPP/START and NO TEARS toolkits.

**Methods:** Ethical permission was granted under a regional IPE evaluation study (Central Office for Research Ethics Committees [COREC], 2005), with patient consent and student permission for analysis of their case study presentations and feedback forms. A mixed-method evaluation was used to examine students' learning. Students completed pre-and post-course questionnaires. Qualitative data was analysed using thematic analysis, quantitative data using SPSS. Student case-study presentations were analysed using content analysis. Feedback reports for clinical teams were analysed using thematic analysis.

**Results:** A total of 525 students (294 medical students and 231 pharmacy students) participated in the course. The students' self-ratings suggested significant advances in their knowledge ( $p < 0.001$ , Wilcoxon signed rank test). Thematic analysis of post-course comments related to the value of collaborative learning, new insights into the management of polypharmacy in older people and how to achieve effective communication to ensure medication safety. One hundred and one in-patient case-studies were identified for students by ward staff (patient age range 40-92 years; prescriptions from 5-36 drugs). In-depth content analysis of 58 patient case presentations and ward feedback forms identified drug errors concerning STOP / START guidelines, unclear prescriptions and drug interactions.

**Conclusion:** This evaluation demonstrates that using experiential learning and reflection, medical and pharmacy students can work together and learn from, with and about each other underpinned by sound pedagogic principles. This short programme further highlights the need for closer working relationships with hospital pharmacists and ward staff for patient benefit and adds further evidence to the recommendations made in the recent NICE guidelines (2016). The results of this evaluation have been recently published (Anderson & Lakhani, 2016).

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## 43: What health-related activities could be delivered by pharmacy students in the Digital Health Enterprise Zone (DHEZ) Academic?

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**Background:** Digital Health Enterprise Zone (DHEZ) Academic building opened in 2017 with the aim of improving outcomes of people living with long-term conditions. This multi-disciplinary facility houses: physiotherapy and optometry public clinics, health promotion areas, and digital diagnostics. Additionally, a medicines review hub with consultation rooms and teaching space was created for the School of Pharmacy and Medical Sciences (SPMS), University of Bradford. Pharmacy students have already successfully performed health-related activities with the public in international literature (Lawrence, 2018). This project explored SPMS academics' perspectives on the potential use of the facility for the teaching and delivery of health-related activities by pharmacy students.

**Method:** SPMS academics (n=10), recruited using a convenience sampling, attended a 15-minute tour of the building and a 45-minute audio-recorded focus group facilitated by a student researcher. After the tour, participants were grouped into: clinically practicing pharmacists (n=4) and non-pharmacists or not clinically practicing pharmacists (n=6). Participants were asked:

- (1) What health-related activities pharmacy students could perform at the facility?
- (2) What challenges could possibly arise?

Participants noted ideas in their groups and presented back for group discussion. Audio recordings and notes were analysed for themes. Ethical approval was obtained.

**Results:** Suggested activities incorporated those already taught theoretically within the programme alongside clinical assessments and provision of health advice (Table I). Academics also discussed at which stage students would be capable to deliver these activities. Additionally, Group 1 suggested possible provision of services currently delivered by registered pharmacies, e.g. travel health clinic, flu vaccinations. Three themes for possible challenges were identified: supervision, logistics, and regulatory requirements.

**Conclusion:** Whilst challenges were identified, academics felt that these activities were suitable options to trial within the programme to reduce the gap between theoretical and practical learning. The next stage is to conduct a feasibility study of students delivering suggested activities to the public.

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**Table I: Health-related activities suggested by participants**

Year	Health-related activities
1,2,3,4	Public health promotion campaigns (design and delivery) Antibiotic guardian and awareness promotion Healthy lifestyle and eating advice Demonstration of how to use health applications Self-care advice
2,3	Collaboration with optometry and physiotherapy clinics Weight management advice Diabetes self-care advice Research project development and delivery Inhaler technique counselling
4	Medicine review type consultations Minor ailments advice Research project development and delivery

#### 45: Triadic assessment of a Stage 4 sexual health option topic: Exploring general trends and the impact of increasing student autonomy on overall mark

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**Background:** The importance of involving students with assessments has been previously recognised in order to deepen their learning and make informed judgements (Race, 2014). With regard to final year M.Pharm. student experience, as tutors we aim to facilitate learning, thus encouraging students to become more autonomous in their learning approach (Higgs, 1988). As our philosophy is such, students should be involved with all aspects of their learning including assessment. Through the use of student, self and peer assessment, it was intended that students would be given more autonomy, thus adopting a student-centred approach.

**Aim:** To explore trends within the triadic assessment marks across two academic years and to compare the impact on overall mark when increasing the weighting of students' self and peer marks.

**Method:** A poster presentation session was conducted as part of the assessment of a final year sexual health option topic. Students were asked to mark their group presentation and also peer mark others within the wider group. Marks were analysed, and the correlation between students' self, peer and tutor marks were compared across two years (2016-17 and 2017-18). Weightings for the years differed as it was decided that we would allow the students more autonomy over their learning and assessment for this work. In 2016 we utilised 33% weightings for average peer, self and tutor mark; compared to 2017, utilising equal weightings for individual peer, self, and tutor marks to calculate overall mark. Self and peer marks which deviated  $\pm 10\%$  from the tutor mark were discounted; averages and weightings were adjusted accordingly when calculating overall marks. All marks are detailed in the graphs to allow observation of trends.

**Results:** Students' self marks were consistently higher than the average peer and tutor marks; in general, tutor marks were lower than other marks (Figure 1 & 2). Trends were similar across years, demonstrating minimal impact when allowing students more autonomy when marking.

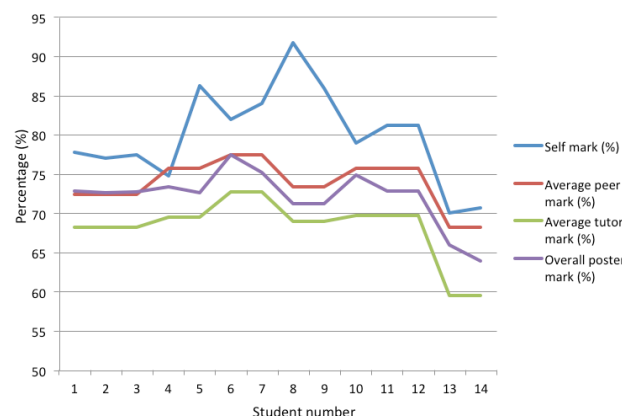
**Conclusion:** Triadic assessment is a useful method for assessing final year students within this context; increasing student autonomy when marking has shown to have minimal impact on overall mark. Next steps are to evaluate students' perceptions of this assessment. We recommend that educators consider this student-centred method when designing future assessments.

#### References

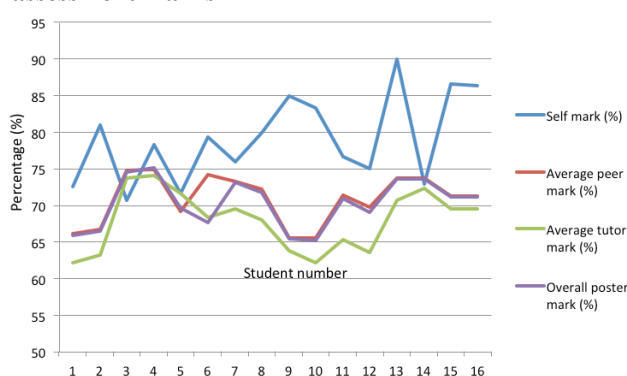
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**Figure 1: 2016-17 Poster presentation triadic assessment marks**



**Figure 2: 2017-18 Poster presentation triadic assessment marks**



#### 46: Rivastigmine as a biodegradable in-situ gelling controlled release injection to overcome barriers in the treatment of Alzheimer disease

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**Background:** Alzheimer is a neurodegenerative disease that is characterised by deterioration of cognitive & memory functions. Rivastigmine (RIV) is one of the most common drugs available for the treatment. The main challenge for its use is the frequent dosing and this is a major problem because Alzheimer's patients usually suffer from dementia and usually forget using medications. It has been noticed clinically that Alzheimer's patients stop taking Rivastigmine during the first year.

**Aim:** The main objective of this research was to reformulate Rivastigmine in the form of novel controlled release in-situ gel to be administered every three months as depot intramuscular injection.

**Method:** Biodegradable, biocompatible polymers as poly-DL-lactide-coglycolide (PLGA), polycaprolactone (PCL), and poloxamer 188 were used in the preparation of different in-situ gelling systems. Every system was evaluated and the in-vivo biodegradability, biocompatibility, histological examination were done on rats. Moreover, pharmacokinetic studies were done on rabbits.

The in-vivo study protocol was revised and approved by the Animal Ethics Committee, Faculty of Pharmacy, King Abdulaziz University (Approval No. 20041438).

**Results:** Results indicated that *in situ* gel base formed from a mixture of 10% PLGA & 10% PCL dissolved in N-methyl pyrrolidone (NMP) is a suitable base for prolonging the release of Rivastigmine for more than three months. The initial burst percentage was 7.4% during the first days and the gel remained in muscle during the test period. The results of pharmacokinetic studies indicated the controlled release of Rivastigmine from the prepared formula for more than three months.

**Conclusion:** Biodegradable in-situ gelling controlled release injection is a promising novel formula for Rivastigmine with prolonged action. This will lead to decreased dose frequency, control the plasma level, decrease side effects, and enhancing the patient compliance.

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## 47: Evaluating professionalism in M.Pharm. students

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**Background:** Professionalism is a multi-factorial concept that comprises of explicit and tacit elements that are difficult to characterise and quantify. Some would suggest that a binary system for certain aspects of professionalism would be preferable. Instruments have been created and tested in the United States which attempt to measure self-rated characteristics of professionalism in pharmacy undergraduates. The aim of this project was to use a United Kingdom (UK)-modified version of an existing tool, the Pharmacy Professionalism Instrument (PPI) (Chisholm *et al.*, 2006) to measure professionalism in undergraduate pharmacy students on the two routes, sandwich and continuous at University of Bradford.

**Method:** The PPI was reviewed and mapped to the General Pharmaceutical Council's (GPhC) 2017 'Standards for Pharmacy Professionals' to assess appropriateness to the UK context (GPhC, 2017). For any identified gaps or incomplete questions, additions and amendments were made accordingly. An electronic survey was created and distributed to pharmacy students in Stages 1, 4 and 5 (sandwich students) and a focus group was held with Year 4 and Year 5 students to triangulate findings. Ethical approval was obtained.

**Results:** From the mapping exercise, there was a gap in PPI around 'Confidentiality and Privacy' so questions were added. In addition, questions about social media were also included. Self-rated professionalism scores were highest in Stages 4 and 5 (94.8; N=5 and 94.0 N=7 respectively) and lowest in Stage 1 (91.4; N=10). Findings from the focus group (N=7) suggested that professionalism development amongst pharmacy students occurred beyond the university and clinical settings.

**Conclusion:** A modified version of the PPI was a useful tool to evaluate self-rated professionalism in pharmacy students and this version will be added to the M.Pharm. programme as part of induction for the new curriculum starting in 2018 to allow students to reflect on their development of professionalism longitudinally.

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## 49: Mapping Entrustable Professional Activities (EPAs) to the General Pharmaceutical Council (GPhC) standards of Initial Education and Training for Pharmacists

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**Background:** The General Pharmaceutical Council (GPhC) is responsible for accrediting M.Pharm. programmes in the United Kingdom (UK), educational outcomes being determined by Standard 10 of the GPhC Standards for Initial Education and Training of Pharmacists (GPhC, 2011). As part of the transformation of undergraduate pharmacy teaching, the University of Bradford, will integrate Entrustable Professional Activities (EPAs) in the M.Pharm. (2018-2024) curriculum to enable students to better track their skills development.

**Method:** With reference to the American Association of Colleges of Pharmacy (AACP) (Haines *et al.*, 2017), we have mapped EPAs for new pharmacy graduates to Standard 10, taking into account local context. We have further determined the level of achievement expected, against each of the EPAs, in relation to different stages of the M.Pharm. programme. Five academic colleagues reviewed the AACP EPAs for relevance to the practice of pharmacy in the UK. Standard 10 outcomes were then matched to EPAs and any identified gaps were filled by developing new EPAs.

**Results:** The AACP EPAs, with some minor adaptations, are applicable to pharmacy teaching in the UK. Some EPAs (*e.g.* those relating to medicines optimisation) need enhancing to incorporate Medicines Use Review and New Medicines Service. Others were found not applicable to UK pharmacy practice (*e.g.* reference to medical insurance). Our mapping of Standard 10 highlighted the need for some additional EPAs (*e.g.* NICE guidelines) and we recognise that some EPAs would not be fully achieved until pre-registration or early years of practice (*e.g.* vaccine administration), however developmental elements, leading to these outcomes, should be retained.

**Conclusion:** We believe that incorporating UK-adapted EPAs into an integrated M.Pharm. programme presents an opportunity to support the development of an evidence-based portfolio of relevant pharmacy practice skills. We are currently developing a task-based approach to delivering EPAs along with a graded method of assessment, which could be used to support the development of pre-registration and foundation pharmacists.

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## 50: It's not fair: Hawks and doves

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**Background:** Coursework assessment is frequently shared between staff. Achieving consistency is difficult with 'dove-like' and 'hawk-like' markers which could lead to perceived lack of fairness (McManus *et al.*, 2006). Using several markers for each student's coursework and taking the mean could address variability but would create additional workload. Comparative judgments offer an alternative where a marker compares A with B and judges which is best. This project aims to explore whether comparative judgements can address inter-marker variability.

**Method:** Five staff members (I-V) agreed to assess a cohort of 180 prescribing portfolios against a set of grading criteria in a final-year summative assessment. Each marker was allocated a batch of portfolios to mark. Thirteen portfolios (A-M) within each batch were identical to allow comparison between markers.

Part 1. Each of the 13 portfolios was awarded a numerical mark (0-15) by each of the five markers (see Table).

Part 2. Each of the 13 portfolios was compared against all other portfolios in pairs to judge which was best (higher mark=2 points, equal marks=1 point and lower mark=0 points). There were 12 rounds of judgments (round 1: A<=>B, B<=>C ..., round 2: A<=>C, B<=>D... *etc.*). The scores from a single marker were used in each round. The results of this exercise were compiled in a league table using an Excel spreadsheet. The points total for each student were then normalised using the highest and lowest mean scores.

## Results:

**Table: Individual student marks and comparative judgement marks**

Part 1: Marks awarded by staff	Students marks (x/15)												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Staff I	6	9	7	7	8	9	4	11	8	7	8	8	7
Staff II	7	12	12	8	6	8	4	12	8	7	7	5	7
Staff III	8	10	11	7	5	11	5	11	5	8	10	11	12
Staff IV	5	9	11	7	6	10	4	12	7	7	8	7	10
Staff V	4	11	9	10	5	9	5	12	9	8	9	5	7
Difference between staff (%)	100	33.3	71.4	42.9	60.0	37.5	25.0	9.1	80.0	14.3	42.9	120.0	71.4
Mean student score	6.0	10.2	10.0	7.8	6.0	9.4	4.4	11.6	7.4	7.4	8.4	7.2	8.6
Part 2: comparative judgement mark													
	A	B	C	D	E	F	G	H	I	J	K	L	M
Difference between Part 1 and Part 2 (%)	1.7	9.8	8.0	9.0	8.3	16.0	0	0	10.8	17.6	9.5	5.6	10.5

**Conclusion:** There was a wide range of marks awarded by the different markers for an individual student (difference 9.1-120%). However, the majority of marks obtained via comparative judgements were similar to the mean from all five markers (nine students difference <10%, four students 10-20%). Comparative judgements have the potential to reduce variation between assessors but further work is required to explore the minimum number of rounds required and impact on staff workload.

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### 51: Does blended learning enhance pharmacy students' understanding of complex, multi-disciplinary topics?

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**Background:** The teaching of complex, multi-disciplinary topics such as biologics is rarely met by didactic teaching and evidence suggests that understanding is optimised when a blended learning (BL) approach is adopted (McLaughlin *et al.*, 2013; See & Conry, 2014). This study assessed student performance in the summative assessment of a specified topic (antibody biologics) pre- and post the adoption of BL in a Level 6 M.Pharm. student cohort.

**Method:** Eleven short (<15 minute) online work packages (WP), PowerPoint presentations (with voiceovers), supported by self tests, videos and animations on antibody biologics, were posted on a virtual learning platform. Students were invited to post questions regarding the topic on an anonymised blog which were addressed during subsequent tutorials using a variety of assessment modalities, including Nearpod. Engagement was gauged by use of a statistics tracking facility and an online survey, while quantitative analyses were obtained by comparisons of closed book exam marks obtained pre- and post-BL.

**Results:** Sixty-three percent of the BL student cohort (n=139) accessed all eleven WPs in the pre-exam period, but the remaining 37% made little or no use of this facility. The other noticeable factor was a waning of enthusiasm, with a 'cliff-edge' fall to only 36% of the students after seven WPs had been accessed. The survey showed broad enthusiasm for BL. Quantitative analyses indicated that mean exam marks for the topic rose by 35% when BL was adopted, predominantly accounted for 25% more students exceeding the pass mark threshold. BL made little difference (1% rise) to the middle mark range sub-cohort but those scoring maximum marks rose from 0% to 9%. This 'triphasic' pattern has been noted in two other cohorts since the initial study.

**Conclusion:** BL improved the understanding of a complex, multi-disciplinary topic by Level 6 M.Pharm. students as indicated by both qualitative and quantitative analyses and its wider application is indicated to support the teaching and learning of such topics.

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### 52: Evaluating the introduction of a mental health hospital placement for Master of Pharmacy students at The University of Manchester

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**Background:** Although many United Kingdom (UK) pharmacy schools provide classroom based teaching on pharmaceutical care of mental disorders, a lack of experiential opportunities to apply learning results in some pharmacists feeling ill equipped to support patients with mental illness (Rutter, Taylor & Branford, 2013). To address this issue, The University of Manchester and three local NHS mental health trusts introduced and evaluated a novel mental health placement for third year Master of Pharmacy (M.Pharm.) students.

**Method:** M.Pharm. students were invited to apply competitively for limited mental health hospital visit places during Semester 2 of the 2016-17 academic year. Hospital sites from each NHS trust accepted six students per visit – each student visited only once. Visits coincided with classroom teaching on mental health therapeutics, and included a ward visit along with inter-professional education. Students completed an evaluation form developed in-house during their visit which contained three Likert scale and four open questions. Hospital tutors were asked for informal feedback via email. Ethical approval was not required.



**Results:** A total of 56 students visited six hospitals across three participating NHS trusts during February–April 2017. Evaluation forms were provided by 46 (82.1%) students. Respondents reported learning about the role of the mental health pharmacist and felt that the visit informed their career choices. Students particularly commented on the importance of understanding the reality of mental health wards and the difference between psychiatric and general hospitals. Recommendations from students and tutors (n=7) to improve future placements focused on expanding the number available, offering the chance to meet patients and better aligning the placement to university teaching.

**Conclusion:** The mental health placement was well received by hospital tutors and students, with clear opportunities for improvement identified. The placement has been offered in 2018 and incorporates these improvements, with four NHS trusts offering placements to the whole third year M.Pharm. cohort.

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### 53: Supporting the management of Type 2 diabetes with pharmacist-led reviews and implementing NICE recommended nine key care processes

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**Background:** A team of pharmacists worked with GP practices in Slough Clinical Commissioning Group (CCG) to identify patients missing any of the NICE-recommended nine key care processes, or whose care processes indicated poor Type 2 Diabetes (T2D) control.

The project aimed to reduce the number of missing care processes and optimise pharmaceutical treatment (NICE, 2015) of patients whose treatment targets for glycated haemoglobin (HbA1c), blood pressure (BP) or total cholesterol (TC) were not being achieved and create an educational legacy.

#### Method:

The project was implemented in three phases:

- data collection, analysis and work-stream prioritisation. A total of 2984 of the 5910 patients were found by the pharmacist team to be missing or not achieving one or more of the care processes;
- treatment was optimised for those patients identified;
- practices received a pharmacist follow-up visit at six and twelve months post-initial review, to evaluate the impact of interventions made.

**Results:** The proportion of patients receiving all the NICE-recommended nine key care processes increased from 46% at project outset in April 2013 to 58% on completion in April 2014.

The percentage of patients achieving HbA1c, BP and TC targets all increased (65%-70%, 70%-76%, 78%-82%, respectively). Quality and Outcomes Framework (QOF) data for Slough CCG showed the percentage of diabetic patients achieving target HbA1c, BP and TC readings increased from April 2013 to April 2014, but then diminished in the year after project completion.

**Conclusion:** Pharmacist-led reviews supported by a multi-disciplinary team increased the number of key care processes administered and improved diabetic control during the year of programme delivery. Whilst the outcomes of the project were positive, the improvements diminished in the year following project completion, suggesting that such programmes should be ongoing rather than fixed term and emphasising the importance of building a strong educational legacy around the NICE-recommended nine key care processes.

#### References

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### 54: Curriculum mapping: Where is professionalism taught on the Master of Pharmacy (M.Pharm.) programme at the University of Bradford?

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**Background:** In 2017 the General Pharmaceutical Council (GPhC) introduced the 'Standards for Pharmacy Professionals' (GPhC, 2017) as a document that was applicable to all pharmacy professionals from day one of education and training. Therefore, this replaced the 'Code of Conduct for Pharmacy Students' (GPhC, 2010) and could have posed a potential gap in the curriculum for pharmacy students. The aim of this project was to map the Standards to elements of learning and teaching on the current M.Pharm. programme.

**Method:** The M.Pharm. programme at the University of Bradford (UoB) develops many of the employability skills required of pharmacists via modules known as 'Capability in Pharmacy' (1-4) which run in each stage of the programme. In addition, students undertake Work Based Learning Placements (WBLP) in each stage of the programme. These include community and hospital sectors in Years 1-3 and community and GP practice in Year 4 (with the option to undertake an additional specialist hospital placement). The new Standards were mapped to 'Capability in Pharmacy' module handbooks

and WBLP workbooks to determine where they were covered in the curriculum and to identify any omissions.

**Results:** Curriculum mapping demonstrated that all aspects of professionalism within the Standard were delivered at all stages to various extents. ‘Capability in Pharmacy’ modules, comprising of eight domains, covered the nine new GPhC Standards well, with one domain (Healthcare Professional) covering six of the nine standards. All nine Standards were also covered in the WBLPs, with placements in different stages and sectors focussing on different aspects, thereby helping students to apply the Standards in different working environments.

**Conclusion:** Interrogating two core elements of the curriculum at UoB, has demonstrated that the M.Pharm. curriculum is sufficiently resilient to changes made by the regulator in 2017. To further support this work, a new project around developing ‘Entrustable Professional Activities’ (EPA) in M.Pharm. students has been established.

#### References

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### 55: Perceptions of undergraduate healthcare students on an inter-professional patient safety workshop

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**Background:** Raising concerns and demonstrating leadership around patient safety issues has received increasing emphasis following publication of the Berwick Report and Carter Review. To address undergraduate leadership requirements of the General Pharmaceutical Council (GPhC, 2011), a new workshop was designed as part of a Year 3 Healthcare Leadership unit. It considered patient safety and was inter-professional (pharmacy, dentistry, dental hygiene, audiology and nursing undergraduate participants (UGPs)). This study explores perceptions of UGPs on this workshop.

**Method:** Pre-workshop, UGPs completed pre-reading on what a patient safety incident is and how to investigate one. Group activities focussed on exploring the incident (anaphylactic reaction) from multiple perspectives (performing root cause analysis and generating recommendations). Post-workshop, UGPs fed-back their views using a ‘stop-change-continue’ post-it-note approach (stating views of what to stop/change/continue), and were asked to state how they felt it contributed to their future practice; this was thematically analysed.

**Results:** Four hundred and forty-nine UGPs attended the workshop; 384/449 UGPs felt that engaging in this case-based task, as a multi-disciplinary team prior to entering the workplace was both beneficial to their future role; 363/449 felt it created a non-threatening environment for honest and open discussion about each other’s responsibilities, which highlighted the importance of a ‘no blame’ culture, as well as emphasising the importance of the duty of care that all professions have in patient care. Nursing UGPs felt that this workshop highlighted the importance of checking patient allergies and would have liked to hear a real patient’s perspective who had been involved in an incident; pharmacy and dentistry UGPs stated how this workshop embedded the importance of clear communication pathways and how to learn from errors; audiology UGPs felt empowered to share their knowledge with other professions. All felt that the process of identifying contributory factors highlighted the importance of acting on concerns and it was no ‘one person’s responsibility’.

**Conclusion:** UGPs felt the greatest benefits were the opportunities for multi-disciplinary learning and honest discussion in a non-threatening environment prior to entering the workplace.

#### References

GPhC [General Pharmaceutical Council]. (2011). Standards for the Initial Education and Training of Pharmacists (online). Available at: [http://www.pharmacyregulation.org/sites/default/files/GPhC\\_Future\\_Pharmacists.pdf](http://www.pharmacyregulation.org/sites/default/files/GPhC_Future_Pharmacists.pdf) Accessed 1<sup>st</sup> June, 2017

### 56: Does student voting behaviour change when using live clicker polls?

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**Background:** Having previously established that team-based clicker usage is preferred to the individual handset model (Pearson, 2017), this work explored whether peer instruction can be further improved by subtly changing the manner in which the clicker polling results are displayed. The aim here was to highlight variations, if any, in student voting behaviour when displaying clicker cohort responses live (during polling) versus after polling.

**Method:** Evaluation of these two approaches relied on data generated from screen-shot filming and from sessional reports created using the clicker software when only the last response from each clicker handset was recorded. The cohort percentages for correct and incorrect responses were scrutinised graphically by analysing voting behaviour at ten-second intervals. Initial clicker response times were also tracked when answering multiple choice questions (MCQs) with two response options and separately for MCQs with three or more options.

**Results:** When displaying live polls the average team-based response times were longer for the slowest 20% of responding teams in the cohort (cf. response times where cohort results were displayed after polling). This observation was seen for MCQs with two options and also for those with three or more options. Cohort performance for team-based MCQs with two options dropped when voting was shown live and improved with live polling for MCQs with three or more options. Interestingly, screen-shot filming showed how many teams changed their mind over time, e.g. correct responses shifted from 52% to 80% in a 70-second window following the time point where all teams had lodged at least one vote.

**Conclusion:** Cohort performance and response times both changed when clicker responses were shown live, during polling. The percentage of correct responses when using live polls was highly dependent on the number of MCQ options provided. In summary, exploring clicker-voting behaviour in this manner highlighted some clear variations and also illustrated that many students change their answer during polling.

#### References

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### 58: Widening participation: Evaluation of Steps-2-Pharmacy & Pharmaceutical Science and its impact on applications to university

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**Background:** Introduced in 2017 for Year 12 students from Widening Participation (WP) schools, Steps-2-Pharmacy & Pharmaceutical Science (S2PPS), a four-day programme of micro-lectures, workshops and laboratory practicals, aimed to increase university applications from WP students, with the objectives of increasing participants' awareness of career opportunities within each profession, and experience of university-style teaching. WP aims to 'double the proportion of young people from disadvantaged backgrounds in higher education' (OFS, 2018). S2PPS targets Stoke-on-Trent, where only 13% of 'disadvantaged' students went in to higher education in 2012 (BIS, 2015). At present, there is no published research into pharmacy-specific WP activity. Twenty-one students participated in S2PPS in 2017, and 22 in 2018.

This evaluation aimed to establish whether S2PPS met its aims and objectives.

**Method:** Students attending one or more sessions were emailed an invitation to complete an evaluation questionnaire composed of Likert rating scales and free-

text questions relating to intention to apply to university, interest in a career in pharmacy or pharmaceutical science, views on S2PPS and strengths and opportunities for the programme. Students' views before and after participating in S2PPS were solicited. The questionnaire was hosted online as a Google Form and completed anonymously.

Responses were analysed using simple statistics and a basic thematic analysis of free-text questions.

**Results:** Of the 43 students to participate in S2PPS, seven students (16%) have applied to this University. Nine students (43%) completed the evaluation in 2017, and ten (45%) in 2018. Combined, 100% (19) of respondents felt S2PPS had increased their knowledge of the roles of the pharmacist and 89% (17) felt they understood university-style teaching better.

Free-text comments showed lab sessions to be popular, with students recommending more practicals would improve the experience.

**Conclusion:** S2PPS successfully met its aim, seeing seven participants apply to the University, with the 2018 cohort not due to apply until October 2018. Application to other universities was not studied, but could be assessed in future evaluations. An additional pharmaceuticals-related lab is under consideration for 2019.

### 61: The influence of experiential learning on M.Pharm. students' career choices

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**Background:** To be accredited, undergraduate M.Pharm. programmes are required to include experiential practice-based learning opportunities. Following the introduction of increasing exposure to practice in our course, this study set out to investigate the influence of teaching and learning on our students' career choices, with a focus on both formal and informal learning.

**Method:** Following University ethical approval, fourth year students were invited to complete a survey. The survey included validated measures (Willis, 2006; 2008) identified through a literature review and piloted with a convenience sample of M.Pharm. students to establish face and content validity. Descriptive and inferential statistics were used to analyse the data using SPSS.

**Results:** In total 129 (86.6%) 4th year students completed the survey. Most were female (n=77; 63.1%), and Asian (n=34; 27.9%). Thinking back to when they started their degree 37.5% (n=48) had intended to work in the hospital sector, 30.5% (n=39) in community pharmacy; as fourth years 48.4% (n=61) expressed a preference for a career in the hospital sector, 19.8% (n=25) for a career in community pharmacy. Experiential learning in the hospital environment was reported as having had a

positive influence on students, with 73.8% (n=79) perceiving formal learning during hospital placements and 61.3% (n=65) perceiving informal learning from their clinical tutors as having influenced their career choice. Female students were significantly more influenced by learning in hospital setting than their male counterparts. In comparison, only 39.3% (n=42) cited their community pharmacy placements as having had a positive impact on their career choice since starting their course.

**Conclusion:** Findings suggest career choice is not stable and that as students are exposed to new experiences their preferences change. Therefore, it is important to provide a range of experiential learning opportunities so that students have a realistic expectation of practice and can make informed choices about their future careers.

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