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01: Instant online feedback on reflective writing using AcaWriter-V1: What do students think of it?

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Background: AcaWriter-V1 (Gibson, 2017) is an online, open source, evidence-based tool that assists students' development of their reflective writing capacity by providing immediate formative feedback on reflective writing tasks. The text in the tasks is processed using Natural Language Processing techniques resulting in analytics and automatic assignment of feedback (Gibson 2017, Lucas 2018a, 2018b).

Aims: Explore student engagement and satisfaction with AcaWriter-V1

Method: An online survey created using Jisc Online Surveys was distributed to all Year 2, 3 and 4 undergraduate pharmacy students in Cardiff School of Pharmacy (n=333). Students were asked to fill in the survey following submission of their personal development portfolios. Open-ended questions were used to explore barriers and facilitators to using the tool, closed-ended questions to establish future intentions, and a 5-point Likert-type scale question explored satisfaction with the tool. Explicit consent was obtained from the students to include data from their survey in published analysis.

Results: A total of 53 responses received (response rate: 16%), of which 20 reported non-engagement with the online tool. Most students who used AcaWriter-V1 engaged with the tool one-two times (n=25), with two students noting they have used the tool more than five times. Students found useful how different areas were highlighted when they had reflected on a different setting, challenge, or emotion and liked the output of a set of criteria identified as needed for improvement. Suggested areas for improvement included providing more detail and free text on how to make changes with feedback. Mean satisfaction was 3.48 (SD=0.99) and 82% stated that they would recommend the use of this tool in every instance where reflective writing is required.

Conclusion: Preliminary results utilising AcaWriter-V1 with three cohorts of pharmacy students are positive, and highlighted areas that would make the tool more helpful. The low response rate limits generalisability of results; further evaluation needs to be completed on an updated version of the tool, with higher number of students

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02: Waste medicines and environmental harm: A pharmacy student project

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Background: Medicines are commonly disposed of in household domestic waste/sewage systems. This has a significant environmental impact on the water system and animals (Boxall, 2004; Owens, 2015). Community pharmacies provide an essential NHS collection and disposal service which helps to destroy or denature these medicines to reduce their effect on the environment which is rarely advertised.

Aim: To evaluate patient behaviour and understanding of waste medicines disposal, to educate the public on the environmental benefits of returning unused medications to the pharmacy, explain the impact of disposing medicines via domestic household waste and domestic sewage on the environment.

Method: The project team developed promotional materials that highlight and instruct the general public about how to safely dispose of waste medicines. Campaign materials include posters, stickers and dispensing bags distributed to 78 community pharmacies, a website, social media campaign and events at community pharmacies and on-campus. Data derived from questionnaires were analysed with simple frequencies and website traffic were analysed for reach and impact.

Results: The campaign indicators were analysed either through SPSS (survey data) or website traffic and reach.

- Pharmacy users (n=1,538) are more likely to dispose of medicines in inappropriate ways (household waste, water system) (42.2% vs. 34.9% return to pharmacy)
- Older pharmacy users (aged 66 to 75) are more likely to return medicines than younger pharmacy users (48% report returning to pharmacy)
- Females are more likely to return medicines to a pharmacy over males (64.1% of those that return are female)
- Males are more likely to dispose of waste medicines in household waste and water systems (36.4% vs. 31.8%)
- Pharmacy users are more likely to return medicines in pharmacies where the service is advertised. Study found 49.9% of sites advertised returns service and 38.7% in these sites returned their waste
- Social media was superior to a website in public engagement (241 website views) compared to Facebook (reach 1,406) which is inferior to Twitter (4,524 impressions).

Conclusion: Inappropriate medicines waste disposal practices exist. Patient education through digital and physical events can raise awareness of the issue and should be targeted at younger men.

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03: Evaluation of a pharmacist training intervention on assessing and managing urgent cases

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Keywords: Pharmacist, urgent care, evaluation, NHS

Background: The pressure on the NHS urgent care system is growing, with urgent or unplanned cases accounting for over 100 million NHS interventions annually (NHS England, 2014). The Centre for Pharmacy Postgraduate Education (CPPE) developed training to support community pharmacists to acquire confidence, knowledge and skills to assess and manage urgent and emergency care interventions (CPPE, 2018), such as ear ache, supporting the NHS vision.

Aims: To evaluate the impact of urgent and emergency care training for community pharmacists on outcomes for practice.

Method: In South London 56 pharmacists attended three pharmacist and GP led two-day training sessions. Pre- and post-course evaluation forms (15 questions pre) consisting of free-text and 10-point Likert scale responses were used, plus follow-up utilising 15 question semi-structured telephone interviews. Questionnaires were analysed with thematic analysis and Microsoft Excel. Interviews were analysed using Quirkos for thematic analysis. Ethics approval was received.

Results: Response rate for the questionnaires was 100% (n=56). All participants (n=56) agreed the course was good, very good or excellent. Knowledge and confidence increased in all areas after the event from Likert scale responses, with knowledge in physical-examination increasing 5.2 points and confidence in clinical history-taking increasing by 4.3 points. Interviews were completed with seven participants to ensure saturation of themes. From these interviews, five themes were identified, each with corresponding sub-themes; consultation skills and history taking, minor ailments, attitudes, local relationships and barriers. Comments received echoed the value of the course, with confidence, patient interaction and improved questioning mentioned by all participants.

Conclusion: This training intervention increased the knowledge and confidence of pharmacists, and application of the learning into practice was good. Pharmacists are an untapped resource who can be used to support NHS initiatives, and training should be considered at undergraduate level to support patient care. More funding is required to enable more pharmacists to be up-skilled.

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04: What might it be like to be you? Using poetry to explore person-centred care with pharmacy students

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Background: There is a changing professional focus in pharmacy with less emphasis on 'the medicine' alone and an increasing emphasis on person-centred care. Inspired by the work of McKie *et al.*, (2008) on using arts and humanities in nursing education and challenged by Shapiro and Rucker (2003) who argue that poetry can make better doctors, the authors designed this session for pharmacy students using poetry to explore person-centred care.

Aims: To explore the use of poetry in developing person-centred care and helping foster empathy in pharmacy students.

Method: Small groups of Year 3 pharmacy students listened to recitation of a poem written by a patient with dementia. Staff facilitated discussions using a semi-structured approach. Students reflected in silence and then facilitated in discussing questions adapted from the literature. Evaluation was using student reflections during the activity and *via* an online qualitative questionnaire afterwards. Data were analysed thematically.

Results: The session has run for a number of academic sessions with over 300 students. Reflections during the sessions were overwhelmingly positive. Following the activity, small numbers of students completed the online questionnaire (n=8) however reflections were consistent with those during the session and were rich in information. These included the power of the experience and the potential impact on their professional lives.

Conclusion: The findings, both during the session and from the small numbers completing the questionnaire show that poetry has the potential to support pharmacy students developing empathy. Shapiro (2003) argues that poetry encourages engagement with situations and people emotionally and intellectually, and helps us to see familiar experiences in different ways as well as helping us to explore conflicting values. This activity appeared to have had the same impact on pharmacy students.

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05: Undergraduate-led mental health promotion in high schools: Impact upon pharmacy students

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Background: Peer education provides benefits to both peer educators and peer learners, including the development of leadership skills, and can bring about positive change in individual health behaviours (Badura *et al.*, 2000). Peer education can be effective for delivering mental health promotion interventions in high schools, and offers an opportunity to contribute to the development of a young persons' mental health and prevent illness and disorders (Weare & Nind, 2011).

Aims: To evaluate the impact of peer education on third year M.Pharm. students delivering a mental health promotion pilot intervention to high school pupils.

Method: A mental health promotion intervention was designed using the Medical Research Council (MRC) framework for complex interventions (Craig *et al.*, 2008). This process involved a scoping review followed by focus groups to establish intervention content and acceptability. The intervention, an hour long workshop involving interactive activities, was then delivered by third year M.Pharm. students to Year 9 (13-14 years old) high school pupils. Impact on peer educators was investigated through thematic analysis of reflective continuing professional development records.

Results: All twenty-eight students who delivered the intervention submitted a reflective piece related to their experiences of delivering the mental health promotion intervention. Reported outcomes of involvement included skills and knowledge development: "*This session allowed me to develop and practice my abilities in person-centred care and my communication and consultation skills*". Students also learned how to be an educator, and valued this for their future practice: "*As a future pharmacist, my role will include educating the public of different age groups and different education backgrounds*".

Conclusion: Peer education has a positive impact on M.Pharm. students, and provides an opportunity for students to contribute to public health promotion. The next stage of this study will involve investigating the impact upon high school pupils using a repeated measures design.

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06: Peer-education: An effective pedagogical approach to supporting pharmacy undergraduate and high school student learning

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Background: Education policy encourages schools to provide health and well-being learning within the curriculum, with the aim of promoting both academic achievement and improving mental and physical health. One method for delivering this learning is peer education, which has benefits for educators as well as learners (Badura *et al.*, 2000). In this study, pharmacy undergraduates were involved in a peer education health promotion activity with high school pupils.

Aims: To develop, deliver and evaluate pharmacy undergraduate-delivered health promotion workshops relevant to health and well-being for high school pupils.

Method: Interactive workshops covering public health topics relevant to 14-16 year olds (Alcohol, Diabetes, Mental Health & Sexual Health Awareness) were developed and co-designed with teachers, with workshop learning outcomes mapped to the appropriate curriculum Key Stage. All third year M.Pharm. students were then randomly allocated to groups (of four) and provided with training prior to delivering a workshop to a class. Brief surveys of pupils and teachers evaluating the workshops were analysed using descriptive statistics; students' perceptions were captured in an assessed continuing professional development (CPD) record and analysed thematically.

Results: Since 2017, 288 M.Pharm. students have delivered 72 workshops to over 2000 pupils across 12 schools. Pupils and teachers rated the workshops highly, with more than 4/5th of survey respondents viewing workshops as having a positive impact on pupils' learning. M.Pharm. students reflected on the value of being a peer educator in terms of improving their team working, presentation, communication and engagement skills, the application of health and well-being learning, and recognition of their role and contribution to sharing knowledge and skills with a younger generation.

Conclusion: Peer education provides opportunities for undergraduate pharmacy students to practise their future role in health promotion. High school children's learning also benefited and supported development of knowledge and skills needed to promote their health.

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07: Exploring the impact of research culture and supervision on postgraduate researcher engagement within the school of pharmacy

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Background: Institutional research culture is influential to a postgraduate researcher's (PGRs) Ph.D. journey and their future career path. It can also impact on how well their research is conducted and the extent of dissemination (The Royal Society, 2018). Recent Postgraduate Research Experience Survey results indicated that 76% of PGRs felt their supervisor helped them to identify their training and developmental needs and 68% believed they had frequent opportunities to discuss their research with a wider community. Despite these encouraging results, engagement with our Pharmacy School PGR seminars and meetings is observed to be poor.

Aim: To explore the impacts of research culture and supervision on PGR engagement by exploring individual perceptions and experiences of resources, environment and training opportunities.

Method: PGRs within our Pharmacy School (n=60) were invited to take part in an anonymous online survey. Open and closed questions were developed based on a review of the current literature surrounding research culture. Responses (n=14) were subsequently used to develop a semi-structured interview topic guide. Interviews were conducted with willing participants (n=5) and thematic analysis was used to develop arising themes. Ethical approval was obtained.

Results: PGRs wanted to be part of and engage with a research culture, where they could "*promote, celebrate and... share ideas and experiences*" (Participant V). However, the rare use of facilities such as the dedicated PGR lounge and poor attendance at seminars and workshops was felt to hinder this. This was primarily based on lack of encouragement for these activities from supervisors. PGRs reported the need to have regular, informal contact with their supervisors, alongside monthly meetings.

Conclusion: Supervisor encouragement was concluded to be one of the major contributing factors driving student engagement with our Pharmacy School research culture. This project was limited by the low number of respondents and it is likely that those PGRs who participated were already contributing significantly to the research culture.

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08: Does the process of self-organising community pharmacy placements help Keele M.Pharm. students to demonstrate graduate attributes?

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Background: The GPhC requires that M.Pharm. syllabi ensure students learn from experience (GPhC, 2011). One way of facilitating this is to expose students to pharmacy placements. At Keele University, M.Pharm. students undertake mandatory community placements (minimum of 18 hours at stage 2 and six hours at stage 3). These students organise their own community pharmacy placements, however support is available, where needed.

Aims: To evaluate whether self-organising community placements helped Keele students demonstrate graduate attributes.

Method: This research was part of a larger evaluation of students' views on self-organisation of community placements. Stage 4 M.Pharm. students (n=58) attending a law ethics and practice lecture in November 2018 were invited to participate in a mixed methods paper-based questionnaire at the beginning of a lecture, using a 4-point Likert scale and open questions to allow justification of ratings. Question design was based on literature and placement intended learning outcomes (ILOs). They were asked to rate their agreement on whether self-organisation of placements helped them to demonstrate or improve their ability in nine different attributes:

- self-confidence
- communication skills
- initiative
- personal motivation
- time management
- writing skills
- IT skills
- networking skills
- professionalism

The data were analysed using descriptive statistics and thematic analysis.

Results: Most students responded to the invite to participate (95%). The participants agreed or strongly agreed that self-organising community placements helped them to demonstrate or improve seven of the nine attributes. The attributes that were not improved were writing or IT skills.

Participants reported that the process of self-organisation of placements “*made [them] feel independent*”. The process also “*helped to improve [their] professionalism, confidence and communication*”.

Conclusion: Self-organising community pharmacy placements helps students to demonstrate a number of different attributes that are required after graduation. The participants did not feel that this process improved their writing or IT skills. This process has been praised by external examiners.

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09: Experiential learning in M.Pharm. programmes: A survey of UK universities

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Background: The General Pharmaceutical Council's (GPhC) Standards for the Initial Education and Training of Pharmacists has stressed the importance of experiential learning (EL) in the M.Pharm., with stipulations that EL should increase year on year, and that tutors receive the necessary support (GPhC, 2011).

Aims: To determine how universities in the United Kingdom (UK) currently structure their EL in the M.Pharm., and assess how the standards specified by the GPhC are met.

Method: Staff in charge of EL in M.Pharm. programmes were surveyed, using a 31-item on-line questionnaire, which consisted of open and close-ended questions. Variables of interest were administration and structure of the EL, tutor issues, and placement sites. To rank the challenges faced, the Relative Importance Index (RII) was calculated (Jarkas & Bitar, 2012).

Results: Twenty (66.7%) universities responded. EL coordinators were mostly academic/teaching fellows (19), and spent 0.29 ± 0.31 Full Time Equivalent on coordination. In 53.8% of universities, tutors completed training annually, with topics primarily focusing on placement structure (85.7%) and requirements (78.6%). Total placement hours in all practice sites over the four years of study ranged from 54 to 496 hours, mainly in hospital and community pharmacy, but also hospices, prisons, and nursing homes. RII calculation revealed the three biggest challenges faced were obtaining/retaining hospital placements (81.82), financial support (80) and quality assurance of tutors (60).

Conclusion: While there has been an increase in the variety of placement sites and EL hours since the last survey in 2003 (Wilson *et al.*, 2006), universities still face the challenges of obtaining placement sites and financial support. There are also gaps in tutor training and development. More standardisation and regulation with regard to the quality assurance of the programme, placement sites, and tutors is needed to ensure students obtain the most out of their placements.

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11: Development of initial programme theories regarding how pharmacists can develop patient-pharmacist communication skills

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Background: Good patient-pharmacist communication improves health outcomes (Stewart *et al.*, 2000). There is, however, room for improving pharmacists' communication skills. These develop through complex interactions during undergraduate pharmacy education, practice-based learning and continuing professional development. Research is needed to determine how best to approach teaching patient-pharmacist communication. The realist review asks what works for whom, how, and why for pharmacists to develop interpersonal pharmacist-patient communication?

Aims: The aim of the research is to understand how educational interventions to develop patient-pharmacist interpersonal communication skills produce their effects.

Method: Realist review methodology explores the link between context, mechanism and outcome (Pawson *et al.*, 2005; Wong *et al.*, 2012). An important step in realist synthesis is locating existing theories and developing initial theories. A scoping search in PubMed and Google Scholar of communication literature revealed a number of substantive theories. Three focus groups were conducted with communications training: one with students representing years 1-5, one with department of psychology and pharmacy faculty involved in teaching communication skills; and one with public participants recruited from advocacy groups. The findings from the focus groups and substantive theories were used to develop initial programme theories.

Results: A number of substantive theories: experiential, structured training, reflective and relational were identified from a scoping review. Focus groups identified a number of aspects for initial theory development. Students favoured experiential learning, simulation and role-play and appropriately acknowledged the need for more authentic communication. Faculty favour simulation and role-play but do not feel adequately

prepared or trained for communication teaching. The focus group with the public revealed poor communication in real life practice and participants feel real-life patients should be more involved in training.

Conclusion: Experiential learning and simulation appear to be the favoured interventions working through contextualisation, repetition, reflection and surprise. Faculty require training for consistent communication teaching. Real-life patients may improve training outcomes through contextualisation. Limitations of this study include substantive theories were identified from the healthcare communication literature only. Communication issues in practice need to be addressed in training.

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13: Investigating students' perspectives of their involvement in inter-professionally delivered health checks to hard-to-reach patients.

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Background: There is emerging evidence that effective inter-professional educational (IPE) interventions can contribute to positive outcomes in collaborative teamwork within the delivery of healthcare (Reeves *et al.*, 2013). Furthermore, the literature recognises that student-lead health clinics benefit student learning and enhance communication, collaboration and leadership skills (Thistlethwaite, 2012).

Aims: To investigate the perspectives of pharmacy and dental students' following their involvement in student-lead health checks to the local homeless population.

Method: A topic guide was informed by a review of the literature; and following their collaborative participation in delivering health checks to the local hard-to-reach population (typically homeless), pharmacy and dental students were invited to take part in focus groups.

The focus group interviews were audio-recorded and transcribed *verbatim*. Two members of the research team independently subjected the transcripts to thematic analysis.

Results: Three focus group interviews were conducted and included five pharmacy students and eight dental students. Two major themes and four sub-themes emerged from the data (Table I).

Table I: Themes and sub-themes that emerged from the data

Themes	Sub-themes
Skills learnt/developed	Service delivery Role characteristics
Collaborative behaviours	Professionalism Communication

Pharmacy and dental students described examples of seeking learning from each other to further their understanding of each other's role and the activities each performed in the delivery of the health checks. Moreover, students reported seeking peer-advice on the development of their own 'soft skills' following observing each other's interaction with the service users. All students expressed their belief that patient care could be enhanced through this collaborative approach.

Conclusion: The findings of this study offer rare insight into the contribution of an IPE intervention for the delivery of patient care in students' learning. Building on the plethora of literature reporting on short-term and/or self-assessed changes in collaborative attitudes, knowledge and skills; this study identifies the development of collaborative behaviours and peer-learning amongst pharmacy and dental students can take place.

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14: An initiative to enhance entrepreneurial skills among undergraduate pharmacy students

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Background: Entrepreneurial skills are important for the holistic development of undergraduate students, so that as pharmacists, they can lead on the creation of innovative health-related services, technologies and therapies in an ever-changing healthcare environment (Lavery *et al.*, 2015).

Aim: The aim of this initiative, implemented for the first time with 3rd year students, was to provide students with the opportunity to develop entrepreneurial skills.

Methods: A one-day programme was developed by the multidisciplinary research team. Students received talks from established entrepreneurs and were guided through the process of idea generation (*e.g.* design thinking, problem identification, solution development, market research). Students worked in groups to develop a business idea which, at the end of the programme, they pitched to an evaluation panel. A pre-test/post-test questionnaire design was implemented; the questionnaires were based on previous research in the area (Souitaris *et al.*, 2007). Analysis was conducted using IBM SPSS Statistics v.25. Thematic analysis was conducted on open-ended data.

Results: Forty-one (65%) and 35 (58%) students completed the pre- and post-questionnaires respectively. Overall increases in entrepreneurial attitudes and intention scores were observed, particularly among female students. Twelve students (37.5%), ten of whom were female, responded that the programme drastically changed their "heart and mind" and made them consider becoming an entrepreneur. The main themes identified from the findings of the programme were: i) Something different; ii) Think in new ways; iii) Think of pharmacy in new ways; iv) Teamwork; v) Inspiring.

Conclusion: The data from this research, albeit from a small study, suggests that this was a successful initiative, which provided students with the opportunity to enhance their ability to identify a business opportunity and increased their awareness of the attitudes, values and motivation of entrepreneurs. Further research should examine extending the initiative and investigate the potential for inter-professional entrepreneurial education.

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15: Evaluating collaborative working of GPs and community pharmacists in a novel project: A focus group study

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Background: Inter-professional collaboration is defined as ‘when multiple health workers from different professional backgrounds work together with patients, families, carers (caregivers), and communities to deliver the highest quality of care’ (WHO, 2010). Recent NHS strategy promotes the collaborative working of GPs and community pharmacists. A novel project was designed to facilitate collaborative working between GPs and community pharmacists. Five GP-community pharmacist pairs participated over a one-year period, which included: dedicated time to observe each other’s practices, leadership training and a quality improvement project.

Aims: To evaluate the collaborative working of GPs and community pharmacists using a conceptual model of collaboration.

Method: A multidisciplinary focus group (FG), using a pre-designed guide, informed by the Bradley *et al.* (2012) model of collaboration was utilised as the data collection tool. The themes covered, encompassed seven themes (Bradley *et al.*, 2012): locality, service provision, trust, knowing each other, communication, professional roles, and professional respect. The tool was designed to explore collaboration with their partner within the ongoing GP-community pharmacist project. Data were analysed using thematic analysis.

Results: Five GP-community pharmacy pairs participated in this study. Key themes identified were Communication, IT, Cost, Time, Insight to Professional Role, Trust and Mutual Dependency, and Education. Themes were mostly discussed as barriers to collaborative working. Trust and mutual dependency resulted in participants discussing their negative perceptions of such terminology. Positive feelings about how collaborations have strengthened throughout this project were reported, and evidenced by the quality improvement projects.

Conclusion: GP-community pharmacist pairs agreed unanimously that collaborative working facilitates improved patient care. In this project, facilitating collaborative practice has improved knowledge and insight of the roles of the other healthcare professionals (HCPs), improving positivity towards future inter-professional working; albeit with foreseeable barriers. Future studies should develop data collection tools to explore the stages of collaborative working of HCPs.

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16: Introducing a pharmacy undergraduate student-led health check service at the University of Bradford

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Background: Development of communication and clinical skills is an important part of pharmacy undergraduate education. Skills training that complements learning from traditional approaches leads to better learning (Vogel & Harendza, 2016). Student-led health check services allow learners to apply their theoretical knowledge to practice and develop such skills.

Aims: To pilot feasibility of a student-led health check service.

Method: Following ethical approval a health check service was designed by adapting the national health check service framework and work at University of Reading (Langran *et al.*, 2017). Six undergraduate students (Year 3) were trained to deliver the service. Students worked in pairs to perform checks over three days in consultation rooms by following standard operating procedures. Supervisors were available at all times. Assessments by students included: BMI calculation; blood pressure; physical activity and lifestyle; QRISK3 calculation. Supervisors performed cholesterol and blood glucose tests. Students interpreted results and offered lifestyle advice to participants. Participants completed feedback forms.

Results: Thirty-eight participants from across the University attended the service. Majority of participants, n=36 (98%) stated they are very likely to recommend the service to a colleague. Many participants (n=33, 87%) stated they would make changes to their lifestyle. The pharmacy students valued the opportunity to perform activities that they would be using once qualified. Students reflected their knowledge improved on cardiovascular risk factors and they felt more confident to provide lifestyle advice. Working in pairs was thought to be a supportive approach, especially during the first checks when students felt most nervous. Whilst students felt competent to perform the tests, they were apprehensive about the questions that participants may ask them. This is an area recommended for future training.

Conclusion: A student-led health check service contributes to the development of students’ confidence in performing clinical activities. Future work will focus on incorporating this service within the pharmacy undergraduate programme.

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17: Application of a technology-assisted flipped classroom to promote and measure student engagement in pharmacy education

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Background: The flipped classroom (FC) is an increasingly popular means of promoting active learning (Rotellar, 2016). Lecture material is delivered beforehand, while class time is devoted to problem-solving. The teaching of pharmaceutical analysis is well suited to this approach. However, one potential pitfall is where some students have not engaged with the background material and are, therefore, unable to fully participate. Additionally, it may be difficult to measure the level of student understanding in large FC settings.

Aims: The aim of this project was to develop a technology-assisted FC in pharmaceutical analysis, which promoted and tracked student engagement with the background material, as well as measuring individual student competency post-FC.

Method: Year 2 M.Pharm. students were presented with two pre-FC online video modules on spectroscopy, interspersed with related questions. Completion of these 25 minute modules was automatically recorded by the Virtual Learning Environment (VLE). Students subsequently participated in two FC sessions on the application of spectroscopy to pharmaceutical analysis. Finally, students completed two post-FC online assignments using a web-based molecular editor (O'Sullivan, 2014). Marks were recorded by the VLE to measure student competency. Following this intervention, student opinions were captured via an anonymous online survey.

Results: Two FC sessions were implemented with 61 undergraduates. Analytics demonstrated that 100% of students had completed both the pre-FC modules and the post-FC assignments in which they attained a 71% average mark. Forty-two percent of students completed the online survey. Forty-eight percent of students agreed/strongly agreed that the pre-FC modules promoted engagement with the background material while 83% agreed/strongly agreed that the overall approach was a "beneficial learning experience".

Conclusion: VLE analytics and student feedback confirmed that our technology-assisted approach promotes pre-FC student engagement. This approach also successfully measures student competency post-FC. However, the effectiveness of the actual FC sessions was inhibited by larger class sizes.

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20: A scoping review of the literature: The management of pharmaceutical waste in pharmacy education

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Background: There is an increasing body of evidence suggesting that pharmaceuticals are present in waterways, e.g., streams, rivers, and lakes and reports that this could contaminate water supplies and threaten aquatic ecosystems. Furthermore, antibiotics disposed of into mainstream sewage may lead to selective pressure and contribute to the development of resistance among populations of bacteria (Kümmerer, 2009). Pharmacists are ideally placed to promote safe medication disposal practice to the public.

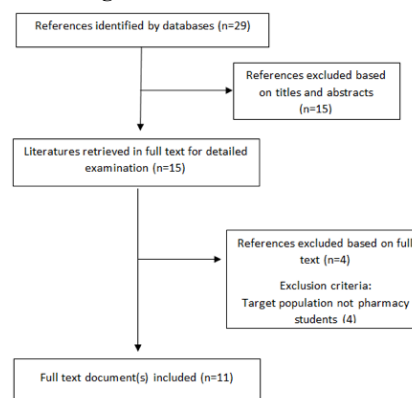
Aims: To review the pharmacy education literature for studies relating to the management of pharmaceutical waste.

Method: A scoping review methodology was employed to identify reports of pharmacy education interventions and to describe gaps in the literature. Google Scholar, Medline and Embase were searched for English language articles published after January 1, 2010 using the key words and MeSH terms agreed upon by the two authors. Articles were selected for inclusion independently, through an iterative process following consensus between the two authors of a broad inclusion criterion. One author extracted the data and adopted thematic analysis to summarise the findings. The second author reviewed the analysis for agreement.

Results: There is a dearth of literature indicating the inclusion of the management of pharmaceutical waste in pharmacy education programmes (Figure 1). Eleven studies met the inclusion criteria from five countries. Six studies described educational interventions, three studies reviewed students' knowledge and perspectives, and the remaining two studies evaluated an awareness campaign.

Further, both the Canadian and Great Britain standards for pharmacy education were reviewed, and found to contain no reference relating to the management of pharmaceutical waste.

Figure 1: Flow diagram results of the search



Conclusion: The United Nations Environment Programme recognises that the management of pharmaceutical waste is a global challenge that requires a multi-stakeholder approach to prevent, reduce and manage their entry into the environment (Thomas & WHO, 2017). The findings from this study indicate that pharmacy curricula are yet to fully adopt inclusion of this issue. This may hinder the establishment of a professional role for pharmacists in this area.

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21: Assessing the suitability of team-based learning (TBL) approach to delivering the national antimicrobial stewardship (AMS) competencies to undergraduate pharmacy students

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Background: Team-based learning (TBL) is a collaborative learning and teaching strategy that promotes a deep learning experience and is suitable for delivering multidisciplinary topics such as the national consensus on the antimicrobial stewardship (AMS) competencies for UK undergraduate healthcare professional education (Courtney *et al.*, 2018). TBL pre-reading outsourced background learning that was applied in subsequent case discussions (Michaelsen *et al.*, 2003)

Aims: Evaluation of an interactive and comprehensive AMS unit for stage 4 M.Pharm. within ten hours student contact time using TBL approach.

Method: The topic content, provided two weeks prior to the face-to-face teaching, was outsourced in the reading pack. Student contact time, ten hours, was focused on two one-hour expert lectures that set the national context for AMS and provided the latest research in antibiotics and immunity. This was followed by eight hours of individual and group activity workshops where students applied the knowledge to short AMS multiple-choice questions (MCQs) and complex antimicrobial cases based on real-life scenarios from primary and secondary care settings. Student learning from pre-reading was quantitatively assessed individually and after team discussion. Student feedback was collected post-teaching.

Results: Table I compares students' scores from individual and post-team discussion. The two-way feedback nature of TBL application exercises meant that students benefited from debating with experienced staff to weigh up patients' risk/benefits in AMS cases rather than just applying antimicrobial guidelines. Student feedback was positive about the format and level of complexity of the cases: "I liked the full clerk-in format for the case".

Table I: Students scores from the assessment of pre-reading material

Assessment type	Range of student marks (%)	Average mark of the class (%)
Individual assessment of pre-reading material (iRAT)	22.2-88.9	51.0
Team assessment of pre-reading material (tRAT)	66.7-94.4	80.8

Conclusion: Outsourcing the broad topic content in pre-reading did not compromise student learning and allowed class time to focus on debating complex simulated cases with experienced staff. Class scores were normally distributed and higher than individual scores for assessment of pre-reading, which is in line with other TBL units in the module.

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22: Teaching cross-sector medicines optimisation to primary care pharmacists using an expert patient

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Background: Working in general practice requires pharmacists to develop a detailed understanding of the complex issues involved with medicines optimisation between different healthcare sectors to facilitate patient centred care throughout the care pathway. In September 2018 the University of Bradford launched a new postgraduate 'Advanced Therapeutics in Primary Care Practice' module. Innovative teaching methods for the module include the use of an expert patient in a clinical teaching session using the Cambridge Framework 'Questioning-Informing' domain (Spencer *et al.*, 2000).

Aims: To evaluate student satisfaction for teaching of medicines optimisation across healthcare sectors to general practice pharmacists utilising the experiences of an expert patient.

Method: The teaching consisted of a two-hour workshop in which an expert patient with long term medical conditions described personal experiences of medicines optimisation between primary and secondary care. The patient journey was split into several stages. Key issues discussed included supply of 'red or hospital only' drugs in primary care, polypharmacy, synchronisation of complex medication supply and communication barriers regarding medication changes. Problems that the patient had encountered were discussed and options for possible strategies explored. Qualitative and quantitative evaluation of teaching was undertaken using anonymous student feedback questionnaires.

Results: Quantitative assessment of student feedback on study day evaluation forms scored highly (mean score 6, score 1-6 where 6=highest). Qualitative feedback showed that students had engaged with the interactive nature of the workshop: *"The expert patient was the most useful part of the module"*.

Conclusion: Pharmacists were able to reflect on previous experiences with cross sector scenarios and work with the patient to identify potential solutions for future practice. They valued this opportunity and felt it would impact on their practice. This successful model for patient involvement reflects level 2 for the 'Ladder of Involvement framework' for service user involvement in teaching and learning. (Tew *et al.*, 2004).

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23: Using stakeholder engagement to develop postgraduate taught programmes for primary care pharmacists

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Background: For over 25 years the University of Bradford has successfully delivered high quality postgraduate taught (PGT) clinical pharmacy programmes for secondary care and community pharmacists. Recent initiatives supporting the development of pharmacists working in primary care (NHS England, 2016) led to discussions with stakeholders who suggested that similar PGT programmes aimed at pharmacists working in primary care would be beneficial.

Aims: To evaluate feedback from stakeholders to support curriculum development and delivery of new and innovative PGT programmes for pharmacists working in primary care.

Method: After initial discussions with colleagues working in primary care, a stakeholder event was held. Delegates, academics, general practitioners, clinical commissioning group managers and pharmacists working in primary care explored actual and potential roles for practice pharmacists. Data captured included the types of skills and knowledge required for pharmacists working in general practice which was analysed into themes. These informed suggestions for curriculum development to meet identified learning needs.

Results: Fifty-six participants attended the event. Evaluation identified the importance of 'softer' skills including an understanding of the primary care team, clinical decision making, project management, quality improvement, staff management and leadership in addition to therapeutics and prescribing skills. A significant theme was recognition of the need to provide support for experienced pharmacists changing sector of practice as well as a longer term solution through the education and training of junior pharmacists to develop their knowledge and skills.

Conclusion: Stakeholder feedback led to the development of two new PGT programmes: The Clinical Pharmacy (primary care) programme, aimed at newly qualified pharmacist, delivers a broad, defined pathway which brings general practice pharmacists to a minimum required level. The Advanced Pharmacy Practice (primary care) programme, aimed at more experienced pharmacists whether new to, or experienced with working in primary care, consists of optional modules which allows a route for experienced pharmacists to tailor their development and take account of previous learning and workforce needs.

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26: Investigating the impact of Dementia Friends Information Session delivery on undergraduate healthcare students in relation to current teaching

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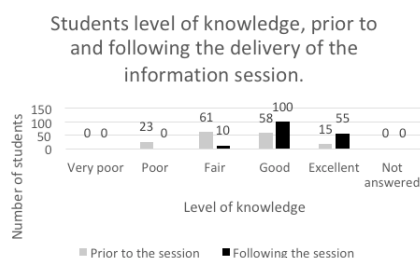
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Background: With current ageing populations, dementia prevalence is rising. Already one in 14 people over the age of 65 in the UK have dementia (Alzheimer's Society, 2018). This number is expected to rise, with the estimate being the number will double by 2045 (DOH, 2015). With this, it is important to evaluate healthcare professionals' understanding of the condition, as it is imperative they are able to provide appropriate care for the ever increasing patient group. Dementia Friends Information Sessions were designed to dispel common myths about dementia and provide information on how to better interact with said patients based on their needs. It is thought this session may be of value to undergraduate healthcare students to help prepare them to interact with this patient group in practice.

Aims: The objectives of this study were to ascertain whether there is currently a gap at undergraduate level surrounding dementia teaching; the dementia friends session could bridge this gap; student knowledge of dementia could be improved; students felt this session would benefit them and their patients in practice; and finally whether undergraduate level was appropriate to implement the session.

Method: Between October 2018 and March 2019 165 undergraduate healthcare professionals (pharmacy (N=119), public health (N=22), adult nursing (N=21) and mental health nursing (N=3)) took part in a Dementia Friends session through university. Students then completed a short survey. This survey was designed to assess students' views on current teaching practices, the value of the session and how they felt it would impact them going forwards.

Results: Students' dementia knowledge increased after the session with a 72.41% increase in those who felt they had a good knowledge and a 266.67% increase in students who felt they had an excellent knowledge. When asked if students felt there was a gap at undergraduate level surrounding dementia teaching, just over half of students either agreed or strongly agreed (52.11%) and most of the remaining students were undecided. Seventy-eight percent of students felt the information session was relevant to their university learning and 84.85% of students concluded the session was either important or very important to undergraduates.



Conclusion: The Dementia Friends Information Session is a successful tool in increasing student knowledge of the condition. It is suitable to be incorporated at an undergraduate level as students feel it is in line with their current curriculum and they feel it will benefit them when they enter practice. Students were undecided as to whether they felt there was currently a gap in their undergraduate teaching, therefore going forwards this could be further investigated with a larger student cohort to find out if students feel there is something missing from their current teaching and if so, what they feel needs to be added to provide a full education for this subject area.

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28: Graduates' perceptions of experiential learning (EL) in the M.Pharm. and its effectiveness in preparing them for practice

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Background: Studies have found that pharmacy students were overwhelmed during their hospital placements, felt experiential learning (EL) in community pharmacies was poor preparation for hospital practice (McCartney & Boschmans, 2018), could not connect university learning with what happens in the pharmacy (Burrows *et al.*, 2016), and struggled to apply their knowledge. (McCartney & Boschmans, 2018).

Aims: To determine graduates' perceptions of EL, and its effectiveness in preparing them for practice.

Method: A cross-sectional online survey involving M.Pharm. graduates from the University of Strathclyde within a year of graduation. The link to the survey was distributed to the graduates in an email sent by NHS Education for Scotland, who coordinate the preregistration year in Scotland. An eight-item survey form was used. Close-ended questions were analysed using SPSS while content analysis was performed on open-ended responses. The Departmental Ethics committee approved the study.

Results: There were 51 responses (45.1%): ten (19.6%) with a hospital post and 41 (66.7%) in community practice. Three-quarters felt the undergraduate EL in hospital was insufficient to prepare them for practice; more than 90% felt students should be allowed to do

placements in other settings such as GP surgeries; more than 70% felt part-time Saturday employment should be recognised by the university as EL; approximately 70% felt the EL was unnecessary; while only approximately 45% felt the EL prepared them for practice. Graduates were ambivalent with regard to the effectiveness of the EL in preparing them in clinical (3.12 ± 0.73), communication and professionalism (3.42 ± 0.79), and technical (2.93 ± 0.80) skills. Content analysis revealed that 16 (70%) had a poor experience during their community EL, with ten (62.5%) of these commenting that they were mainly used as dispensers.

Conclusion: There is a need to restructure EL to allow more time in hospital, and restructure the content to ensure students will be well-prepared for the workforce in core skills. Quality assurance of placement sites along with a greater emphasis on tutor-training are warranted. Future planned qualitative interviews will provide more depth to the findings.

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29: Student and staff perceptions of voluntary sector placements

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Background: Voluntary sector placements offer a promising form of experiential learning for undergraduate healthcare students to facilitate the development of a range of intrapersonal and professional characteristics and skills that are important for both undergraduate education and future practice (Bell *et al.*, 2015).

Aim: This qualitative study aims to investigate the perspectives and anticipated outcomes of both academic staff organising the initiative and students required to participate.

Method: All Stage 2 Pharmacy students (n=75) were invited to participate in the study and academics were selected due to their involvement in the scheme (n=4). All consenting students were included in the study. In-depth, semi-structured interviews were conducted to investigate student and staff perceptions of voluntary sector placements. Interviews were audio-recorded, transcribed *verbatim* and analysed using inductive thematic analysis. Ethical approval was awarded by the institutional research ethics committee.

Results: The study comprised six students (male n=2, female n=4) and three academics (male n=1, female n=2). Academics and students interviewed believed that voluntary sector placements could foster the development of multiple beneficial skills such as communication and organisational skills, empathy, leadership and professional responsibility. Academics stated that the placements could improve students' academic development and help them to appreciate the wider context and issues around health and the healthcare system that could affect an individual's health. Academics also believed the experience could help students meet the General Pharmaceutical Council's competency standards for pharmacy professionals, specifically around professional intra-personal and communication skills. Although students agreed with the many benefits of these placements, the main perceptions included such placements would be time-consuming and are less relevant to their education at this stage.

Conclusion: Academics conveyed that voluntary sector placements could aid pharmacy students learning and develop their interpersonal and communication skills, helping them to fulfil the required competency standards for pharmacists. However, students may not perceive the link of volunteering to their education and future profession, which hinders their acceptance of the initiative.

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31: Evaluating the students' perceptions of their communication skills before and after UK clinical placements: an international clinical pharmacy summer school for Cairo University students

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Background: M.Pharm. students in the UK are commonly exposed to patients during their programme of study. Such interactions help them apply their clinical knowledge, practise communication skills, and develop their soft skills (Alshahrani *et al.*, 2018). Cairo University pharmacy students may not have the same opportunities because of different

requirements of their programme. The University of Manchester in partnership with three teaching hospitals hosted an International Clinical Pharmacy Summer School (ICPSS) for students in their penultimate year of a five year B.Sc. programme. The two-week programme combined ward-based learning and didactic teaching to contextualise students' knowledge with real-life patients.

Aims: The aim of this study is to evaluate the students' perception of their communication skills before and after completing ICPSS.

Method: A questionnaire was administered twice to all 14 participating students which assessed their perception of their communication skills using closed Likert scale and free text questions stemming from five themes: confidence in talking to patients; knowing what to say; preparedness; importance of talking to patients; and sources of anxiety. Cochrane-Armitage trend test was used to assess changes in trends in response.

Results: Initially, two (14.3%), two (14.3%), and three (21.4%) students agreed to the statements "I feel prepared to talk...", "I feel confident about talking.." and "I feel comfortable in a ward environment", respectively, but after the placements 92.9% strongly agreed/agreed to these statements. Moreover, five (35.7%) and eight (57.1%) students initially strongly agreed/agreed to the statements "I know how to start a conversation..." and "I know how to end a conversation...", respectively, however after the placements all the students strongly agreed/agreed to these statements (14, 100%).

Conclusion: Results underscore a positive trend in students' perceived communication skills, which demonstrates the importance of contextualising learning with patient interaction. Limiting factors include not quantifying their actual communication ability, small sample size, short duration of the ICPSS and presence of social desirability bias.

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33: An assessment of emotional Intelligence in M.Pharm. undergraduates

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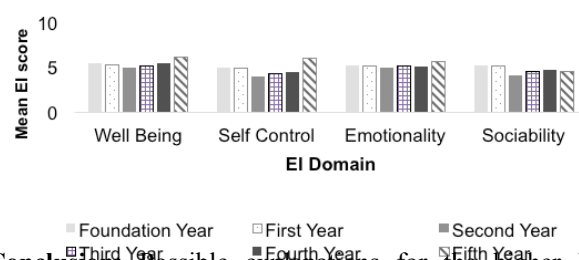
Background: Emotional Intelligence (EI) is the ability to perceive, understand and manage emotions. Higher EI is associated with effective leadership and improved patient outcomes (Sfantou *et al.*, 2017). EI may be developed through training, however the majority of UK pharmacy schools do not explicitly teach leadership. An assessment of M.Pharm. students' EI may determine whether current teaching supports EI development.

Aims: To measure M.Pharm. students' EI and explore any variation between and within year groups.

Method: All M.Pharm. students at one UK university were invited to complete the short form trait EI questionnaire (TEIQue-SF) online (Petrides, 2009). TEIQue-SF measures an overall global trait EI score and produces separate scores in four domains: well-being, self-control, emotionality and sociability. Participants rated their agreement with 30 statement items on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). A mean score was calculated for each measure with higher scores indicating greater EI. An open question was included to capture leadership experience. Descriptive and inferential statistics were used to characterise participant responses and explore the relationship with leadership experience.

Results: Eighty-two (22%) students participated and the mean \pm SD EI score was 5.02 ± 0.7 . There was no correlation between EI and year of study. Mean EI score was higher in students with self-identified leadership experience (5.10 ± 0.61) than those without (4.61 ± 0.13 , ISTT, $p < 0.001$). Figure 1 illustrates the distribution of domain scores across the different cohorts. Statistical analysis of EI scores across the four domains was prohibited due to the distribution of response.

Figure 1: Distribution of EI domain scores by cohort



Conclusion: Possible explanations for the higher EI scores in those with leadership experience include that those with higher EI are more likely to seek leadership positions or that leadership experience supports the development of higher EI. Further investigation is required to explore how the M.Pharm. degree can support EI development.

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35: The benefits of training and implementing clinical prioritisation pharmacy technicians at North Bristol Trust

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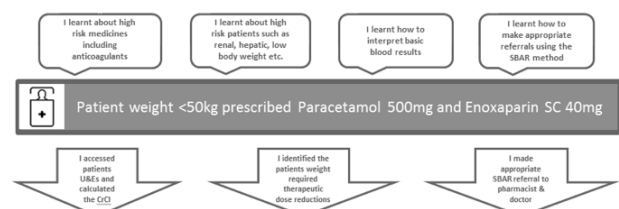
Background: Pharmacists and ‘clinical’ pharmacy technicians need to spend more time on clinical services than other activities (Carter of Coles, 2016: p.31) and increase capacity to deliver the NHS Long Term Plan (NHS England, 2019). Pharmacy services can be transformed by optimising the skill mix of the pharmacy workforce to ensure high risk patients and medicines are prioritised to improve outcomes and reduce risk. The clinical prioritisation training programme develops new skills enabling pharmacy technicians to meet the demands for this evolving clinical role.

Aims: Demonstrate the benefits of training and up-skilling pharmacy technicians to apply clinical prioritisation skills at North Bristol Trust (NBT).

Method: A change in practice as a result of the training programme undertaken by pharmacy technicians was evaluated by recording pharmacist activity data collected before (2017) and after (2018) implementation of the new clinical prioritisation role. Clinical prioritisation pharmacy technicians applied a Red, Amber and Green ranking tool to prioritise patients for the pharmacist and recorded the interventions they could identify as a result of the knowledge gained from the training programme. Feedback from pharmacy technicians who had undergone the training programme was obtained.

Results: The pharmacy technicians who undertook the training to develop clinical prioritisation skills were able to identify, manage and refer significant interventions. This practice was deliverable through the underpinning knowledge taught in the clinical prioritisation training programme such as identifying high risk medicines and patients, interpretation of blood results and methods of referral.

An example of its application in practice:



Feedback shows the training programme for pharmacy technicians to develop clinical prioritisation skills has benefits to pharmacy skill-mix and job satisfaction.

- “The programme has given me new knowledge which helps identify problems with patients’ medications that I may not have recognised previously; I look at a drug chart in a completely new way”
- “Gives me the confidence to have greater clinical input, reigniting my passion as a pharmacy technician”

Conclusion: Pharmacy technicians are valued members of the ward based clinical pharmacy team. Their role can be greatly enhanced by providing post-registration training which develops new relevant skill sets to complement their knowledge and skills and enhance their roles and responsibilities. The clinical prioritisation training programme has provided a structured competency based framework where pharmacy technicians can demonstrate that they have the necessary skills to develop into advanced practice and improve outcomes for patients

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37: Use of reality television in video case-based pharmacy practice teaching

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Background: Case studies are used to help students apply scientific and theoretical knowledge within clinical contexts derived from real practice. Text-based cases are widely used in pharmacy practice teaching at a local university. These are easy to develop, cheap and do not require much resource or technological know-how (Kenny & Beagan, 2004; Pedersen *et al.*, 2017). However, text-based cases cannot simulate emotion, body language and verbal cues, therefore may induce emotional detachment in students (Kenny & Beagan, 2004; Pedersen *et al.*, 2017). Video-based cases can convey these elements, while also helping students develop powers of observation (Pedersen *et al.*, 2017). In this study, Box of Broadcasts was used to obtain clips from the reality medical television programmes Medical Emergency and Island Medics to develop video-based case studies for third-year teaching sessions.

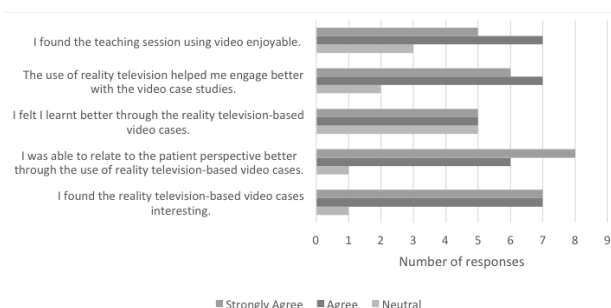
Aims: To evaluate the impact of the use of reality television-based video cases (from the students’ perspective)

Method: This was piloted on 61 third-year M.Pharm. students. An online wordcloud was used to gather immediate feedback from the students from two of four workshop sessions. This was followed-up by an online questionnaire to elicit more thoughtful, delayed feedback from all students.

This study was ethically approved. Simple statistical methods were used to analyse quantitative data and thematic data analysis was used to draw out themes from qualitative data.

Results: The online questionnaire had a response rate of 25%. Figure 1 shows the responses from the Likert scale questions. The average score from all questions was 4.00-4.47 of 5.

Figure 1: Use of reality television in video case-based pharmacy practice teaching



Themes emerging were:

1. Understanding the patient experience
2. Improved understanding of study material
3. Meaningful application of theory to practice
4. Realism

Conclusion: This study shows reality television-based case studies are useful to increase student understanding, application to practice and development of empathy. Future work could include comparing text-based against video-based case studies and inviting students to focus group discussions to further explore their views on this teaching method.

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38: Gamification in M.Pharm. teaching

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Background: Gamification is the use of game mechanics to promote engagement and enjoyment in a variety of tasks for the purposes of learning. This interactive and collaborative approach when applied to healthcare education has been shown to improve student knowledge and understanding (Shawaqfeh, 2015), and further develops communication and interpersonal skills in a range of settings (Kim *et al.*, 2018). The benefits of these activities rely on well-designed games, based on the 'laws of learning' and the 'laws of good game design' (Mora *et al.*, 2017).

Aims: To develop pharmacy-based games, that provide an interactive peer led learning activity and evaluate their ability to increase student engagement in key areas of the M.Pharm. curriculum.

Method: Final year project students surveyed all 107 final year M.Pharm. students using the Ombea audience response system. Analysis of these results identified pharmaceutical/ medicinal chemistry and pharmaco-kinetics as areas of interest, which guided the focus, and design of the games. Students developed game prototypes and a process of initial testing and refinement was carried out within the development group. Beta testing with small groups of students from final year was conducted (three groups, eight students per group). Feedback was collected from each test as a group interview and individual questionnaire to assess engagement and effectiveness.

Results: This project produced a versatile new game - 'Pharmopoly'. This fits well within our integrated spiral curriculum, with game mechanics which place particular emphasis on the chemistry and pharmacokinetic concerns raised, providing a fun and novel way for students to engage with course content. Pharmopoly represents a versatile teaching tool which can be used to target specific year groups and subjects through development of appropriate question banks while maintaining the game mechanics.

Conclusion: This game provided a fun and engaging teaching tool while supporting the attainment of key learning outcomes as demonstrated by the positive student responses in the post-test evaluation. However, this game needs to be further tested with larger groups of student in a classroom setting. These results add to the growing body of literature supporting gamification as an effective tool in healthcare education.

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42: Evaluation of training for case-based discussion (CbD) assessors

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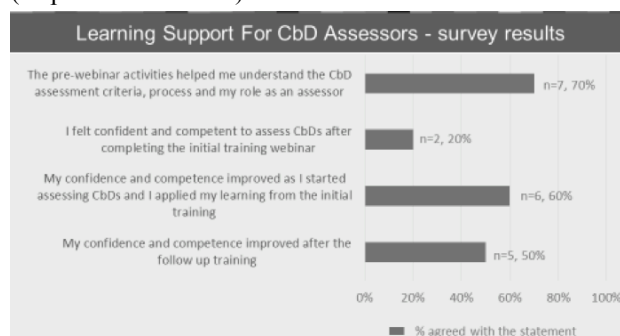
Background: Case-based discussion (CbD) is one of the assessment methods used for postgraduate pharmacy education programmes. The Academy of Medical Royal Colleges (2016) highlights that assessor training is essential to ensure understanding of the assessment system, assessment methods, their purpose and use.

Assessors completed pre-workshop activities, participated in a training webinar prior to assessing CbDs and a follow up webinar after assessing CbDs. The follow up webinar facilitated discussion around challenging assessment decisions and provided peer support opportunities.

Aims: To evaluate CbD assessor training workshops and make recommendations for the next cohort of assessors.

Method: An anonymised online survey was sent to 38 assessors. The survey included multiple choice opinion statements and free text questions to gather assessors' opinions on their confidence and competence in undertaking CbD assessments following training.

Results: Ten of the 38 assessors completed the survey (response rate 26.3%).



Conclusion: The pre-workshop activities provided assessors with the underpinning knowledge for their role. However the majority of respondents did not feel confident or competent to assess CbDs after the initial training webinar and reported feeling improved confidence and competence once they had started to assess CbDs. The follow up training provides peer support for assessors, the opportunity to critically review and improve assessment practice and has the potential to help assessors improve their competence and confidence. Further work is recommended to explore assessor competence and confidence in more detail.

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45: Collection and analysis of learner specific data improves delivery of national training programmes for pharmacy professionals

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Background: CPPE was commissioned by Health Education England to provide national learning programmes. The NHS England clinical pharmacists in general practice education programme will place 1,650 clinical pharmacists in general practice by 2020/2021 (NHS England, 2016) and the NHSE Medicines Optimisation in Care Homes programme will train 600 pharmacy professionals. Data analytics is required to support learners and efficient learning delivery in both national pathways.

Aims: To support learning of pharmacy professionals in national pathways through utilising data to monitor learners' progress, increase engagement, identify early additional support and planning effective learning delivery

Method: A data analyst is currently employed for the duration of the learning national pathways. The pathway lead, data analyst and IT team created responsive data solutions and engaged with the education support team to support the growing number of learners. Live online trackers were developed for learners. All data in the CPPE database were collected according to GDPR.

Results: A variety of resources were created. A regional learner distribution map was created, supporting peer group learning and the assignment of education supervisors to learners. Automated monthly reports were used to sequence each learner's module choices, including booking and attending learning modules and workshops.

Each learner completes a live online tracker that monitors their progress, increasing their level of engagement with the pathway and allowing for early identification of any required additional support by their education supervisor.

Conclusion: Collection, analysis and presentation of learner data has proved to be effective in supporting national learning pathways teams in planning modules, monitoring progress and ensuring learner-centred educational support for learners. Using these solutions allows a training programme and educational support to be run on a national scale for a large cohort of learners. Future use of data could include predicting attrition rates of learners and changing some less-attended events to an online platform.

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46: Pharmacist's Dilemma: An example of large scale, in-lecture gamification

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Background: Gamification is the process of using 'play-based' activities to promote the learning or consolidation of knowledge or understanding. One important aspect of gamification is that learners, of any age, can see the positive or negative consequences of their actions within a safe and controlled environment. There are several examples of the adoption of gamification both in pharmacy education (Sera & Wheeler, 2017) and in other professions (Routledge, 2016).

Aims: To use a game-based activity, which models commercial transactional choices across the pharmaceutical supply chain, to demonstrate how trading quality improves as regulatory checks are introduced. The effectiveness of the activity in illustrating the learning outcomes is monitored.

Method: The game of 'Pharmacist's Dilemma' is based upon the famous game theory concept of 'Prisoner's Dilemma'.

One hundred and forty third year pharmacy students attending a lecture were given four pieces of paper (representing batches of product) labelled with numbers (-4, +1, +1 and +1) to trade with their neighbours under different rules mimicking regulatory checks (specifically GMP technical agreements and audits). The object of the game was to finish the lecture with an overall 'positive hand'. Trading behaviour and student feedback was monitored with a web-based Kahoot quiz.

Results: The trading behaviour of the 47 survey respondents is shown in Table I.

Table I: Survey results under different trading conditions

Regulatory checks	Game mimic	Respondents trading '-4 batches'
None	Anonymous, blind trades	52%
Technical agreements	Agreed, blind trades with a chosen individual	23%
As above with audits	As above after inspecting individuals hand.	29%

Fifty seven percent of respondents answered positively when asked if the game illustrated the lecture's learning outcomes.

Conclusion: The Pharmacist's Dilemma game illustrates effectively how regulatory checks improve trading choices and contributes positively to the lecture's learning outcomes.

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47: Supporting pharmacy professionals to transition to patient facing roles

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Background: The NHS emphasised the patient-facing aspect of the general practice pharmacist in their Five year forward view (NHS England, 2016). Evaluation of the Centre for Pharmacy Postgraduate Education's (CPPE) national pilot learning programme in 2016 identified some barriers to the 450 enrolled GP pharmacists becoming patient-facing (Bradley *et al.*, 2018). In March 2017, a report found that only 84% of these pharmacists were patient-facing. A further survey (Wright, 2019) uncovered the main remaining barriers and led to the creation of resources to support pharmacists.

When CPPE developed the second phase training programme for 1,650 pharmacists in general practice, proactive action was needed to address these identified barriers to the patient-facing role.

Aims: To support pharmacy professionals become patient-facing.

Method: Building on the learning from the pilot programme, more support was given to pharmacists to be patient-facing. A role progression handbook and 30 minute facilitated peer training session was introduced at the beginning of the programme. The handbook clearly outlines progression in both medicines leadership and patient-facing roles, with practical examples given to pharmacists. In the face-to-face session, pharmacists work together to plan how to implement their personal role progression journey in their GP practice and create an action plan.

Results: There are currently 155 pharmacists who are 12 months or more into their pathway. Results were recorded for 76% of pharmacists (n=117). Ninety-four percent of these pharmacists are patient-facing, an increase of 10% after the introduction of active support and resources.

Conclusion: There seems to be a positive correlation between the active support of pharmacy professionals early on in their training to become patient-facing and being patient-facing within a year. A significant limitation of this study is around the definition of 'patient-facing'. Further research could focus on the amount of time spent on patient-facing activities.

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50: Introducing Entrustable Professional Activities (EPAs) and 'do-able tasks' to Stage 1 M.Pharm. students: A student inclusive approach

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Background: Developing Professional Practice (DPP) is included at each stage of the Bradford M.Pharm. The SLICE assessment tool (Green & Silcock, 2018) is used to plot student development towards Entrustable Professional Activities (EPAs) (Haines *et al.*, 2017). Students have initially struggled with matching their learning to EPA development, particularly when this is not explicitly referred to in the classroom.

Aims: To identify do-able tasks from recent teaching and relate these to EPA development and student perception of teaching material.

Method: Stage 1 student representatives (n=10 - 61) and five academics (responsible for recent teaching) attended fortnightly focus groups where teaching material was reviewed to determine any new skills development; these were tabulated and shared with the whole cohort. All students subsequently used the SLICE assessment tool to self-grade a range of these do-able tasks.

Results: After two weeks of teaching students were able to identify 38 different do-able tasks, many of which they were encountering for the first time. Students were able to see these do-able tasks as being developmentally important in achieving end of programme EPA completion. After three months, students had identified over 100 discrete do-able tasks, related them to EPA development and observing that earlier tasks were being repeated at a higher level of complexity (as evidenced by the SLICE assessment tool). In addition, the focus groups provided useful two-way feedback about which skills were being developed (intended and unintended) allowing for the identification of curriculum gaps or missed learning opportunities.

Conclusion: Our student-inclusive focus groups have been instrumental in introducing EPAs to our students who can now identify do-able tasks and relate them to their development. This student-inclusive review of teaching also highlights student perception of teaching material and can be used to support curriculum mapping, review and development.

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53: "This gave me an insight into hospital pharmacy!": M.Pharm. hospital orientation placements, facilitated by pre-registration pharmacists

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Background: Interaction with patients and the healthcare context is essential for confident and competent pharmacy graduates and is a requirement of the UK pharmacy regulator. Despite this, delivery of student placement experience in M.Pharm. courses is an ongoing challenge for schools of pharmacy in the current funding climate. Alternative ways of resourcing delivery of placement experiences need to be explored.

Aims: To explore the feasibility of using pre-registration pharmacists to deliver a hospital orientation placement experience for Year 1 pharmacy students.

Method: Year 1 M.Pharm. student at Aston University (n=167) visited six hospital sites in small groups (n=6) during one week in December 2018. Sessions were facilitated by pre-registration trainees following training from academic staff and teacher practitioners. The session explored the patient journey, the role of pharmacy in addition to general orientation to a hospital and ward environment. Student and pre-reg views were collected after the event *via* surveys and evidence statements.

Results: Student feedback about the experience was overwhelmingly positive. Comments included: 'I felt I gained a lot of useful pharmacy related information that I would not have learnt if I did not complete this placement.' One student felt that the session could have been more interactive with patients, however this was not the purpose of the placement. Feedback from the pre-reg's indicated that they enjoyed the experience: 'I felt the sessions were beneficial and I wished I had them'. It also enabled them to record evidence for "contributing to the education and training of other members of the team" (GPhC, 2011).

Conclusion: This placement activity was successful both in terms of the M.Pharm. student experience and developing the pre-registration pharmacists in education and training. The logistics of large student numbers and six hospital sites were a challenge but it appears to have been worth the effort involved.

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54: Informing the design of inter-professional education using an action research approach

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Background: Inter-professional education (IPE) is used to develop collaborative behaviours and practice in undergraduate pharmacy students. IPE should be guided by student-practitioner dialogue and theory, with realistic approaches to evaluation that are inclusive of, and responsive to context (Olson & Bialocerkowski, 2014). The use of action research methodologies are well-suited to guide a rigorous and learner-centred approach to the development of IPE.

Aims: To critically explore undergraduate pharmacy student perceptions of the role of IPE in developing collaborative behaviours and practice at the study institution.

Method: A sequential exploratory mixed methods design was used, including structured post-session evaluation questionnaires and voluntary semi-structured focus group interviews with final-year undergraduate pharmacy students at the study university. Qualitative data were anonymised, transcribed and coded before being inductively thematically analysed by the researcher-practitioner, and confirmed with student participants. Data were interpreted with reference to learning theory, through a reflexive, context-specific lens by the researcher-practitioner.

Results: A total of 74 students (100%) completed the post-IPE session evaluation questionnaire, seven of whom later participated in the focus group. Findings showed that students particularly valued how IPE helped foster their appreciation of other professionals' roles and challenged misconceptions. Participants described IPE interventions that encouraged meaningful discussion and challenge as most helpful and engaging, particularly when undertaken in a simulated environment.

Conclusion: Overall, students demonstrated a positive attitude to IPE and its ability to develop collaborative behaviours and practice. Students were able to articulate, through the focus group and session evaluation, both beneficial and hindering features of IPE, which enabled critical reflection in order to evaluate and develop IPE at the study institution. The study was limited by a short duration and small sample of highly engaged students. Ongoing curriculum evaluation and development with a greater variety of students is required to sustain improvements to IPE.

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58: Preparedness for prescribing and inter-professional working through clinical simulated - preliminary findings

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Background: The National Health Service (NHS) faces unprecedented patient demand and financial pressure. Proposals that pharmacists - through expanded clinical roles and greater integration into NHS services (Smith, Picton & Dayan, 2013), may help address these challenges. In doing so, pharmacists will be required to undertake more prescribing-related duties and inter-professional team-working. However, to enable tomorrow's pharmacists to contribute fully in such roles, it is likely that curricula and teaching methods will need to evolve to meet their changing training requirements.

Aim: To assess the effectiveness of an inter-professional teaching session to facilitate acquisition of prescribing skills and preparedness for inter-professional team-working in M.Pharm. and also MBBS (medical) students.

Method: A 1½ hour inter-professional teaching session was conducted for 3rd year M.Pharm. students and final year MBBS students over two successive year-cohorts. Teaching comprised prescribing problems which students worked through in inter-professional groups of 2-4 with facilitation from tutors as required and covered therapeutic areas relevant to the management of in-patients, out-patients with chronic disease and patients in special circumstances. The teaching was optional and undertaken in the St George's University of London Low-Fidelity Simulation Suite with appropriate props to replicate elements of clinical environmental working. All participants were required to complete a self-administered feedback questionnaire incorporating the Inter-professional Educational Perception Scale (IEPS) (McFadyen, Maclaren & Webster, 2007) before and after the teaching session.

Results: A total of 123 students (89 M.Pharm., 34 MBBS students) completed feedback questionnaires in the two year-cohorts observed. Students agreed or strongly agreed the session was useful (88% of M.Pharm. and 89% of MBBS students) and improved confidence in inter-professional working. Total IEPS scores improved in both M.Pharm. (92.1±8.4 after vs 86.6±9.1 before, $p<0.001$) and MBBS students (92.8±8.4 after vs 88.1±9.1 before, $p=0.003$) after compared to before the teaching session.

Conclusion: Inter-professional M.Pharm. and MBBS small group, facilitated teaching sessions of prescribing problems incorporating low-fidelity simulation may be a useful format for helping prepare students for future inter-professional team-working and prescribing roles.

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61: What can educators learn from the types of clinical interventions made by community and hospital pharmacists?

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Background: As the pharmacist role continues to expand (Scahill *et al.*, 2017), it is increasingly important for postgraduate (PG) educators to understand individual pharmacist learning priorities. Continuing education is important for lifelong learning and should reflect meeting current practice challenges. (Tofade *et al.*, 2015).

Aims: The aim of this evaluation is to provide clinical educators insights into the type of clinical interventions made by community pharmacists and how this compares to hospital pharmacists.

Method: As part of De Montfort University's PG Clinical Diploma, there is a pharmacy education module called 'Clinical Foundations'. One of the assessment components requires pharmacists to self-select and submit four clinical interventions from a variety of clinical topics to demonstrate learning from the module, and that which is directly relevant to their professional practice. Available topics include: 1) Assessment of Clinical Data; 2) Antimicrobial Stewardship; 3) Use of Medical Records; 4) Drug Interactions; 5) Therapeutic Drug Monitoring (TDM); 6) Drug Handling in Special Groups (e.g., pregnancy, paediatrics); 7) Venous Thromboembolism (VTE). The interventions submitted by community pharmacists were compared to those from the hospital sector. Anonymised data were collected, with permission, from their final assignment.

Results: Data were collected from a cohort of PG pharmacists (101 from community, 97 from hospital). The Drug Interactions topic accounted for the highest number of interventions from each sector (40.1% in community vs 27.0% in hospital). Community pharmacists submitted approximately three times as many interventions than hospital pharmacist on Drug Handling in Special Groups (34.7% vs 12.1%). Hospital pharmacists submitted greater numbers in Assessment of Clinical Data (26.8% vs 8.5, TDM (7.7% vs 3.7%) and VTE (10.2% vs 3%).

Conclusion: This investigation is of importance to pharmacist educators. It demonstrates that whilst there are areas of common practice between different pharmacy sectors there are also areas of differences. In order to improve pharmacists' engagement with the widest possible scope of clinical interventions, pharmacy educators need to be mindful of intra-disciplinary expectations. To improve their scope of practice, further practical learning examples/vignettes could be used to expose pharmacist to clinical situations that they would not otherwise experience. Data were collected in one institution so the findings may not be generalisable to all pharmacists.

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62: A questionnaire-based study to investigate future pharmacists' attitudes towards team work

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Background: Being able to work effectively in a team is an essential requirement of the United Kingdom (UK) Master of Pharmacy (M.Pharm.) accredited degree programme (GPhC, 2011). Future pharmacists need to know how to "engage in multidisciplinary team working" and show how they "contribute to the education and training of other members of the team" (GPhC, 2011).

Aims: To investigate Queen's University Belfast pharmacy students' attitudes towards team work. Objectives were to: ascertain students' opinions on team work, including skills gained and professional development; determine preferred types of team-based activities; and establish whether parameters (such as gender) affected responses.

Method: Following ethical approval, final year M.Pharm. students were invited to participate in this voluntary study. Data were collected *via* a self-completed, pre-piloted questionnaire (distributed at a compulsory class in December 2018). The questionnaire was developed with reference to published work in the area (Elmore *et al.*, 2014). Questions were largely closed-question type style with only non-identifiable data requested. The responses were coded and entered into Microsoft Excel and SPSS (v.22). The analysis largely took the form of descriptive statistics and the Mann Whitney U-test was employed for inferential statistical analysis, with significance set at $p < 0.05$ *a priori*.

Results: A response rate of 96.8% (92/95) was achieved. Most [81.5% (75/92)] found team work to be valuable and 76.7% (69/90) deemed it was essential to ensure they became safe and effective pharmacists. Males were more likely to want further team-based learning within the course than females (52.2% versus 34.3%, $p = 0.03$). Only 53.8% (49/91) reported liking peer evaluation. An interprofessional session with medical students was the most popular activity (interpolated median score = 3.69, maximum score 5).

Conclusion: Opinions about team work (including multidisciplinary) were positive which is encouraging. However, more should be done in relation to peer evaluation, particularly given its importance for professional development and revalidation.

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64: Preparation for practice: final year pharmacy students' reflections on their M.Pharm.

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Background: M.Pharm. students' experiences of teaching and learning have previously been shown to predict their perceived preparedness for practice, with variation in perceived preparedness reported when analysed at the level of school of pharmacy attended (Willis *et al.*, 2009). In the study reported here we sought to investigate final year students' perceived preparedness for practice in the context of recent reforms to standards for the initial education and training of pharmacists.

Aims: To determine final year M.Pharm. students' perceived preparedness for the attributes and values associated with performance and training outcomes important for effective clinical practice.

Method: A questionnaire was distributed to five cohorts of final year M.Pharm. students based at United Kingdom (UK) schools of pharmacy. Twenty-five statements related to the values and attributes of effective clinical practice derived from the Professional Attributes Framework (Health Education England, 2016) were used to capture students' views on the impact of their M.Pharm. on preparing them for practice. Descriptive and inferential statistics were used to analyse the data.

Results: Response rates varied between 47-92% with a total of 353 students completing the questionnaire. Participants were most likely to be female (64%), to agree that they were prepared in relation to the clinical knowledge required for practice (98.3%), for effective communication (96%), and to provide patient-centred care (94.6%); fewer felt prepared to take on leadership roles (80.3%), or to remain calm under pressure (80.5%). Significant differences in perceived preparedness were found for 12 of the 25 statements when analysed at the level of pharmacy school attended.

Conclusion: Ensuring pharmacy graduates are prepared for practice is a fundamental role of educators; given variation in undergraduates' perceptions of extent to which their M.Pharm. has prepared them, future research should focus on determining whether, longitudinally, such differences are important for effective clinical practice.

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65: Does the use of interviews in the recruitment of undergraduate pharmacy students influence choice of university? A study of Year 1 & 2 M.Pharm. students

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Background: Interviews are not currently compulsory in the recruitment of undergraduate pharmacy students, however a General Pharmaceutical Council (GPhC) consultation for changes to the Standards for Initial Education and Training for Pharmacists (GPhC, 2019) proposes to make interviews and assessment of numeracy skills a compulsory requirement in the admissions process.

Johnston (2010) established that factors such as personal contacts and visits to the university influence choice of university, however it is not clear whether being interviewed is a factor in this decision, with no published data found that indicate what pharmacy students believe should be involved in an interview for a pharmacy programme.

Aims: The study aimed to determine whether or not inclusion of interviews in the admissions process influenced students' choice of school of pharmacy. Specific objectives included identifying whether or not pharmacy students believe interviews and numeracy assessments should be part of the recruitment process.

Method: Following ethical approval, an anonymous paper questionnaire composed of 5-point Likert rating scales and free text questions was circulated to all M.Pharm. Year 1 and 2 students at the end of a teaching session. Descriptive analysis was applied to the data and free text responses analysed for emerging themes.

Results: With a response rate of 82% (n = 114/138), 77% of participants (n=88/114) indicated that being interviewed influenced their choice of university; however only 12% of participants (n=14/114) ranked interview the most influential factor, with viewing the campus identified as the most influential factor. Seventy-seven percent (n = 88/114) of students felt that interviews should be a compulsory part of the recruitment process, with only 24% of respondents (n=28/114) agreeing that assessment of numeracy should be included in the interview.

Conclusion: The findings of this study suggest that although interviews are an influential factor in choice of university, viewing the campus is of greater importance to students. Participants feel interviews should be a compulsory step in the admissions process, however assessment of their numeracy skills should not be included in the interview.

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71: Developing medical and pharmacy education supervisors within an acute trust

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Background: Medical and Pharmacy Education Supervisors (ESs) are required to undertake update supervisor role recognised training under respective regulatory and professional bodies guidance. Local education providers are required to provide an ongoing programme of faculty development needs. Brighton and Sussex University Hospital Trust had successfully established a Medical ES one day course to help fulfil this requirement.

This was further developed to include Pharmacy ES and support Inter-professional Learning (Barr, 1998).

Aims: The course's aims were to bring together Medicine and Pharmacy ES, providing support, supervision and training in a large multi-site and multi-professional Trust, share learning from challenging and fulfilling situations, and event evaluation.

Method: Workshops with interactive sessions related to supervision relevant to both ES professional groups were developed. Scenarios were provided to enable participants to work through the difficult areas of educational supervision *i.e.* Trainee in need of Support. For each session participants completed a four-point Likert scale questionnaire where 1=poor and 4=excellent. Participants were asked to identify good aspects, least useful aspects, and areas for improvement.

Results: Twenty-six ES attended; 85% (22) Medical and 15% (4) Pharmacy. Evaluation response was 100% (26).

Sessions scored an average 3.3. Practical updates and skills sessions were more popular especially sessions on trainee support (3.7), feedback provision (3.3) and Technology Enhanced Learning (3.4). Comments identified the benefits of this opportunity to network with other ES and felt the day had improved working relationships. Requests acknowledged for additional case studies, further integration with the Medical and Pharmacy ESs, e-portfolio profession-specific session and opening the event to other healthcare professionals (HCPs).

Conclusion: Evaluation highlights benefits of integrated Medical and Pharmacy ES training. Small numbers of Pharmacy ES acknowledged as a limitation. The agenda is being developed for all HCPs with additional practical sessions and a session running concurrently on specific professional portfolios

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72: Pharmacists - helping and hindering pharmacy technician professional development

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Background: Pharmacy technicians form a relatively new professional group in the pharmacy team. Typically they work closely with a pharmacist, who is their line manager and team leader. As we seek to support pharmacy technicians in learning about professionalism in practice, we identified different experiences of the impact of the pharmacist and their role in supporting the development of the pharmacy technician.

Aims: To build an awareness of the varied impact of pharmacists on the professional development of pharmacy technicians.

Method: We held a single focus group with 12 pharmacy technicians from different areas of practice to support our creation of a learning programme on professionalism. Part of the conversation related to examples of pharmacist impact on their learning and personal development resulting in creation of case studies.

Results: Although a small group, our participants shared case examples from their own practice which demonstrated a stark contrast in the impact of the pharmacist on their development. In some cases the pharmacist had been the catalyst for the learning and career development of the pharmacy technician, building their sense of self worth and opening opportunities. In other cases the pharmacist had actively prevented the pharmacy technician from being able to develop their career.

Conclusion: Pharmacists have a large impact on the learning that their team does and may not realise that they are both a barrier and a catalyst to the ongoing development and concepts of professionalism for their colleagues.

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73: Patient safety: Evaluating the numerical skills of undergraduate M.Pharm. students and their perceptions of numeracy in clinical practice

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Background: Healthcare professionals are required to utilise numeracy skills as part of their everyday practice to ensure the safe and effective use of medicines (Arkell, 2012). Ensuring competency in pharmaceutical calculations is therefore an essential part of pharmacy education. In 1993, the registration assessment was introduced and tested numeracy skills in the form of 20 multiple choice questions (MCQ). In 2016, the General Pharmaceutical Council (GPhC) introduced significant changes to the assessment (GPhC, 2016); the numeracy aspect became a standalone assessment, with 40 free-text answer questions over two hours. There is a paucity in research evaluating numeracy skills in pharmacy undergraduates.

Aims: To assess undergraduate M.Pharm. student performance in a range of pharmaceutical calculations and evaluate their perceptions of numeracy in clinical practice.

Method: Level 3 (n=163) and level 4 (n=168) M.Pharm. students at one UK pharmacy school were invited to sit two numeracy papers. Paper 1 included ten questions using an MCQ format, followed immediately by paper 2 with ten questions that matched the new GPhC free-text answer format. The papers were designed to map key numerical skills (Table I) with a pass mark of 70%. A questionnaire was given to all participants to explore their perceptions of numeracy used by pharmacists in practice.

Ethical approval was granted by the University Research Ethic Committee.

Table I: Mapping of key numerical skill within paper 1 and 2

Numerical skill	Question in paper 1	Question in paper 2
Dilutions	3	7
Displacement value	8	3
Dose regimens	1	5
Extemporaneous preparation	4	1
Health economics	9	6
Infusion rates	5	8
Molecular weight	6	4
Pharmacokinetics	2	9
Quantities to supply	7	2
Using provided formula	10	10

Results: Completion of the assessments and questionnaire achieved a response rate of 75% (n=247); 28% of level 3 and 48% of level 4 students passed both papers. Most students (74%) felt the free-text answer calculations were most like clinical practice, but struggled with these with 72% of students failing this paper. These questions tested

the same numeracy skills as the MCQ question paper where 61% of students passed. Students commented that they needed more support in numeracy from the institution.

Conclusion: Level 3 and 4 pharmacy students had difficulty with the numeracy assessment, especially with free-text answer questions that reflect the new GPhC assessment and clinical practice. The institution will review and redesign the numeracy support provided to students.

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75: M.Pharm. student-led opportunistic screening for hypertension and atrial fibrillation in community pharmacy

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Background: Hypertension and atrial fibrillation (AF) are predominant but preventable causes of stroke. However, the prevalence of undiagnosed hypertension and AF both remain high, and, there remains an urgent unmet need to improve their detection (Public Health England, 2017a; 2017b). With advancement of pharmacists' roles, it is possible this need can now be met within the community pharmacy setting.

Aims: A project was designed for a final-year M.Pharm. student to pilot an opportunistic hypertension and AF screening service within a community pharmacy.

Method: Following training, the student approached individuals attending an urban community pharmacy and screened consenting participants for hypertension and AF using the Microlife Watch BP Home A device. Electrocardiogram (ECG) tracings were acquired using an AliveCor Kardia Mobile device. Those tracings that were abnormal or suggestive of possible AF, were emailed directly to a cardiovascular specialist for further interpretation and GP referral where appropriate. Patients identified with a high BP were offered a home blood pressure monitoring (HBPM) machine with training to confirm their BP. A self-administered questionnaire designed to establish knowledge on AF and feasibility of providing an AF/hypertension screening service within a community pharmacy was also distributed to local pharmacists.

Results: A total of 42 out of 66 (64%) people approached consented to screening. Six individuals were found to have an elevated BP and one with possible AF was identified.

Approximately 25% of responding pharmacists (n=12) were unable to correctly identify at least half of the established risk factors for AF from a list of options (provided); four pharmacists were unable to identify at least half of the symptoms caused by AF.

Conclusion: This study demonstrates that, with appropriate training, hypertension and AF screening can be undertaken within community pharmacies, and implemented more broadly to support national strategies aimed at preventing stroke. M.Pharm. curricula now need to be developed to facilitate acquisition of composite skills and confidence for future pharmacists to develop and deliver such clinical services.

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76: Exploration of the use of an e-portfolio for pre-registration training within an integrated M.Pharm. degree

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Background: The University of East Anglia (UEA) introduced an M.Pharm. with placement degree in September 2016, enrolled students undertake two integrated pre-registration placements in years 4 and 5 respectively. Trainees collect a portfolio of evidence to demonstrate competence in 76 performance standards (GPhC, 2018). To facilitate this UEA introduced an electronic portfolio.

Aims: To explore the benefits and drawbacks of the e-portfolio when used as part of integrated pre-registration pharmacist training.

Method: UEA ethics committee granted ethical approval. An on-line questionnaire was sent to eligible tutors and trainees. The questionnaire included Likert scale or free text response questions. Questions explored opinions on functionality and impact of the e-portfolio and compared it to a paper-based portfolio. Participants were also invited to undertake a telephone interview. Questionnaire results were analysed using descriptive statistics, with thematic analysis of interview transcripts.

Results: Seventeen questionnaires were received from 45 potential respondents; 13 trainees (46.4%), 4 tutors (23.5%). Four telephone interviews were undertaken (3 trainee, 1 tutor). The results indicated the majority of respondents found the e-portfolio to have a high level of usability, with over 80% finding features including performance standard sign-off, ability to log evidence and the progress summary to be useful or very useful. Ninety percent felt the e-portfolio allowed for successful transfer of information between placements. Most acknowledged the e-portfolio allowed third parties to review evidence. Time required to upload or review evidence were the main negative aspects reported. Four themes were identified from the telephone interviews: Information technology, Impact of training, Security and Transferability.

Conclusion: The use of an e-portfolio is a useful tool for the collection of evidence during pre-registration training. The major benefit reported was the ability to transfer information and monitor progress. There was limited generalisability with only one university involved.

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77: Evaluation of the use of video as a learning tool in a national Polypharmacy workshop

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Background: The concept of modelling is recognised as an effective method in teaching consultation (Bandura, 1997). The aim is to enable the observer to recall observations and have the motivation and capability to apply to practice (Dickson *et al.*, 1989). A series of videos were created to demonstrate effective consultation skills for pharmacy professionals consulting with people affected by polypharmacy.

The videos were shown after the clinical vignette (communication and taking a patient-centred approach) activities in the national Polypharmacy focal point workshops. The purpose was to model good practice and deliver real practice examples of using role play to support learning and change in practice.

Aims: The use of video in focal point was a new concept for tutors and learners. The evaluation aimed to establish whether the videos:

- Reflected real practice
- Illustrated good practice
- Reinforced learning outcomes
- Supported individual learning about consultation skills and taking a patient-centred approach
- Contributed to the overall learning experience.

Method: A simple evaluation form was developed. Three tutors from each region were nominated to ask learners to complete the evaluation forms at the end of their Polypharmacy focal point workshops. Completed forms were input into a Survey Monkey questionnaire by Head Office staff. General comments from tutors regarding the use of video in focal point events were also collated.

Results: Four hundred and sixty five completed evaluation forms were received.

	[Not at all] 1 (1)	2 (2)	3 (3)	4 [A lot] (4)	Total	Weighted Average
Reflect real practice	1.08% 5	10.75% 50	48.39% 225	39.78% 185	465	3.27
Illustrate good practice?	0.00% 0	0.65% 3	24.95% 116	74.41% 346	465	3.74
Reinforce the learning objectives of the workshop?	0.00% 0	2.37% 11	27.96% 130	69.68% 324	465	3.67
Support your learning about communication and taking a patient-centred approach?	0.00% 0	2.80% 13	29.89% 139	67.31% 313	465	3.65
Contribute to your overall learning experience at the workshop?	1.08% 5	6.67% 31	38.49% 179	53.76% 250	465	3.45
Motivate you to want to watch the other Polypharmacy videos on the CPPE website?	1.29% 6	5.38% 25	31.18% 145	62.15% 289	465	3.54

Conclusion: The use of video to support learning from the clinical vignettes section was generally very well received by participants and tutors. The results suggest that the video learning enhanced the face-to-face learning experience. Learners felt the videos reflected real practice and could relate to them. They also recognised the demonstration of good practice. Video learning is now an integral part in the development and delivery of face-to-face and other learning formats.

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80: Do females perform better academically? An analysis of gender performance in the M.Pharm. and A-level data for STEM subjects

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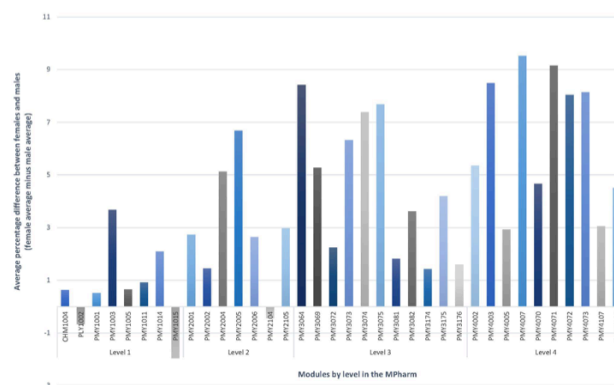
Background: There is an extensive amount of literature based on students' academic performance at university (Richardson *et al.*, 2012). Several papers postulate reasons for this but relatively few investigate gender as a factor affecting performance.

Aims: This study aimed to investigate whether there is a difference in academic performance between genders within the M.Pharm. degree programme at the School of Pharmacy, Queens University, Belfast (QUB). Objectives were to: ascertain if there were differences in performance between stages and modules in the M.Pharm. degree and to investigate performance difference in A-level STEM subjects commonly taken by entrants to the M.Pharm. degree.

Method: Anonymised gender-disaggregated M.Pharm. module results were obtained from the School of Pharmacy for the past five years of student cohorts (n = 627). A-level results from 2010 to 2018 for four Science Technology and Maths (STEM) subjects (Chemistry, Biology, Physics and Maths) were obtained from the Joint Council for Qualifications (JCQ) website (JCQ, 2018). All data were analysed using Microsoft Excel (2018) to calculate mean marks and grade profiles for male and female students. Gender performance within and between the data sets was plotted using bar charts *i.e.*, STEM subject grades and M.Pharm. module results, and trends in performance noted.

Results: Overall, male and female students achieved similar grades for each STEM subject, with females marginally outperforming male students. There is a drop in the percentage of female students achieving the highest grades in some STEM subjects. There is a large difference in academic performance between genders in the M.Pharm. degree, with females achieving higher marks in 33/36 of the modules over the five-year period (Figure 1).

Figure 1



Conclusion: Data show that while there is little difference between gender performance at A-level in STEM subjects, females outperform males in the M.Pharm. degree subjects. This performance difference widens as students progress through the degree. Further research is required to understand the reasons why males underperform on the M.Pharm. degree at QUB.

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83: Inclusion by design: Embedding inclusive teaching practice into design and preparation of laboratory classes

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Background: Creation of an inclusive learning environment and providing individual adjustments are duties of the higher education providers (Hockings, 2010). However, teaching on the ground level, and especially laboratory practical teaching, is not always inclusive beyond the general university requirements. Practical in-lab classes especially can present many barriers to disabled learners. At the same time some proactive adjustments embedded into the design and preparation of the laboratory classes can make lab-based teaching as inclusive and accessible as possible.

Aims: The aim of the study was to develop general accessibility guides and provide the laboratory teaching staff with examples of good inclusive teaching practice.

Method: The main challenges/difficulties/barriers students with disabilities might experience during the practical in-lab classes were identified (through consultation with University disability advisors and on-line resources (SCIPS, 2019), personal teaching experience) and analysed. A systematic review of a large number of sources (*i.e.*, International and British Dyslexia Associations, UK Association for Accessible Formats, Institute of Physics, W3C Consortium) was conducted and the best available evidences of inclusive practice in science/medicine laboratories (including those already implemented in the Reading School of Pharmacy and Leicester School of Pharmacy) were retrieved, critically appraised and summarised.

Results: Recommendations on the embedding inclusive practice into design and preparation of the practical classes in pharmaceutical science were developed. In particular, comprehensive recommendations on how to make: i) all printed materials (handouts, standard operating procedures [SOPs], instructions, notes, *etc.*) accessible (with emphasis on the readability, reading comprehension and preparation for text-reading software); ii) video files accessible; iii) careful use of colours. Also the usage of a range of pedagogic techniques as well as assistive technologies (AT) in inclusive teaching was discussed and many examples of AT were provided.

Conclusion: Active implementation of the ‘inclusive-by-design’ approach, in contrast to ‘inclusive-on-request’, can be beneficial not only for the learners but for the teaching staff as well since inclusion-by-design helps not only to modify a particular practical class once but to establish an inclusive culture in laboratories.

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84: An evaluation of one year's data on the uptake of community pharmacist clinical pharmacy modular training, delivered on behalf of the Pharmacy Integration Fund (PhIF)

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Background: The PhIF was established in October 2016 (NHS England, 2016), to promote the greater integration of pharmacy professionals in local NHS care models. As part of the implementation strategies, funding was made available for eligible community pharmacists to undertake postgraduate clinical pharmacy courses.

The data to be presented was drawn from a full year's intake of distance-learning students.

Aims: To collect, collate and analyse data on: numbers of enrolled students and the run rates; which module choices had the greatest uptake; patterns in the first three module choices, which could be linked with NHS service transformation goals; demographic data on where the students were employed.

Method: Descriptive statistical analysis was performed on data routinely collected, in relation to students on modular study pathways. This included module choices, recruitment rates and applicant demographics.

Results: There have been 204 registered students. One hundred and thirty-six modules have been completed, with a further 240 in progress.

Table I shows the most popular first three module themes, chosen by the individual students.

Table I: First three module choices, by key themes

Module Themes (first three choices)	Total number of students	Percentage of students
Cardiovascular Disease	168	82%
Preparation for working in general practice	148	73%
Endocrine (inc. diabetes)	62	30%
Leadership & Change Management	38	19%
Respiratory Disease	26	13%

Table II: Breakdown of student applications per region (England only)

Students by Location		
Region	Total	Percentage of students
North East	23	11%
North West	34	17%
East Midlands	19	9%
West Midlands	65	32%
East of England	12	6%
South East	39	19%
South West	12	6%
Total	204	

The geographical spread of applicants showed a nationwide pattern, with only 32% coming from the West Midlands (historical catchment for PG Pharmacy courses) (Table II).

Conclusion: So far, the module choices made by students, with a preference for cardiovascular, endocrine (including diabetes) and respiratory disorders, would support that the pharmacists have engaged with the most common long-term conditions seen in primary care. They are also indicating a preference for modules that would prepare them for working alongside local general practice multi-disciplinary teams. This would be in-line with key goals of the PhIF and the NHS Long Term Plan (NHS England, 2019).

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86: Identification of learning preferences and background knowledge differences to facilitate students' learning and experience

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Background: Cancer biology is an optional unit for the final-year medicinal chemistry and pharmacy programmes. The considerable variation of students' background knowledge in advanced chemistry for medicinal chemists and a combination of biology and chemistry for pharmacy students affect their ability to understand advance topics taught in this unit. This pilot study was aimed to inform the design of taught materials by identifying students' learning preferences and background in subject field. This information was used to bridge the knowledge gap and enhance efficient learning for students.

Method: An on-line survey combining the on-line Visual, Aural, Read/write, Kinesthetic (VARK) learning style questionnaire and lecture-specific background knowledge related questions was conducted (autumn semester 2017-2018). VARK questionnaire was used to identify each student's learning preference by providing a platform for students to reflect on their learning style. Also, 20 questions (two questions per lecture) were used

to evaluate students' background knowledge and ability to understand the lectures. The questionnaire was sent to all students *via* email and students were asked to fill these online independently without text book or support from their colleagues within two weeks. A descriptive statistic was used to report the results.

Results: Most students (58.3%) of this cohort (n=12) were multimodal learners, followed by visual learners (25%) and read/write learners (16.7%). Further, with the background questionnaire majority of the students knew the correct answer to 14 questions. The knowledge for the remainder six questions was lower, only 33%-83% of the students knew the correct answer.

Conclusions: Guided by this survey results, staff were able to (where appropriate) supply relevant material to bring everyone's background to a similar level and facilitate learning using different aids (such as visual aids and papers). Future work will be developed to explore the differences between chemistry and pharmacy students, impact of this on student grades and student satisfaction with the unit.

95: What's the verdict? Evaluation of an inter-professional simulated court trial

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Background: Professional negligence is a key aspect of pharmacy education (GPhC, 2011). As a result of the evolving role of the pharmacist, there is the increased risk of professional negligence in their everyday practice. Simulated court trials provide a valuable learning experience for students.

Aims: To determine the views and attitudes of pharmacy students and trainee barristers who participated in an inter-professional learning (IPL) mock court event exploring cases of professional negligence.

Method: Following ethical approval, a paper-based survey was completed by students and trainee barristers who participated in a mock court trial. A total of 105 pharmacy students and 21 trainee barristers took part in the activity. Two separate focus groups were undertaken, one for pharmacy students and one for trainee barristers. Descriptive statistics were used to analyse the questionnaire data and a thematic analysis was undertaken on transcripts from the focus groups.

Results: Ninety-six pharmacy students (response rate = 91.4%) and thirteen trainee barristers (response rate = 61.9%) completed the questionnaire. In addition, six pharmacy students and four trainee barristers took part in the focus group. Overall both student groups had very positive feedback with regards to the teaching session. The main concerns from the pharmacy student

respondents were based on preparation, court procedures and case information. Both pharmacy students and trainee barrister respondents reported issues with the timing of the session in the semester, as well as the time available for the cross examination. Themes that arose from the focus groups included realism, future improvements for the session, intensity of the experience, future practice, engagement and application of knowledge.

Conclusion: The use of mock court trials are a valuable activity to allow students to have a better understanding of the medico-legal world. In addition to allowing students to apply their knowledge of the legislative framework and professional standards, they can be used to promote confidence, oral skills, critical thinking skills and teamwork skills. Results from this study will be used to refine this learning activity in the future.

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96: Explore the feasibility of applying online distance learning to facilitate pharmacy continuous professional development in China

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Background: Currently, there is a shortage in the pharmacy workforce in China, and increasing healthcare needs due to the ageing population. E-learning has the potential to address China's need for a vast-scale of pharmacist capacity development. This study aimed to explore the feasibility of applying e-learning to facilitate Chinese pharmacists' continuous professional development (CPD).

Method: Anonymous surveys were conducted in 2017 and 2018 at CPD training workshops from four institutes in China to identify pharmacists' needs and preferred learning styles. A series of four, ten-minute online learning units were co-developed between British final year pharmacy students and a Chinese pharmacist, under advice from academic e-learning experts. The online course was launched on the China Health Promotion Foundation platform from March 2019. Five-week administrative data were collected to analyse the engagement.

Results: The response rate of survey varied from 22.5% to 64.4% across different institutes. Of the 91 and 115 responses collected in 2017 and 2018, community pharmacy services (94%-85%) and drug abuse

prevention (96%-67%) were recognised as the most urgent development needs in China. Most participants favoured small-group lecture (81%-83%), and 59%-50% favoured self-direct study and e-learning. There is a significant reduction in preferring large-group lecture (78%-43%, $p<0.001$) and workshop (79%-59%, $p=0.026$) between 2017 and 2018. Five weeks after launching the course, 2,356 learners registered for the four units (589 each), but only 90 learners (3.8%) accessed the video. Overall, only 16 (0.7%) and 25 (1.1%) learners completed the pre- and post-course questionnaire survey.

Conclusions: Most Chinese pharmacists favour the traditional style of teaching delivery methods, although increasingly prefer interactive small-group teaching. Many pharmacists are interested in the online course, but the completion rate is low due to no reinforced incentives and suboptimal learning management system. Further qualitative study is needed to explore learners' journey and usability of e-learning CPD.

97: Calculating the cost of student Fitness to Practise investigations

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Background: The Faculty of Health Sciences and Wellbeing, University of Sunderland, includes Nursing, Pharmacy and Health, Paramedic and Clinical Sciences, all regulated by professional bodies. Fitness to Practise (FtP) investigations commence when there is an allegation that a student's behaviour or health may impact on the safety of patients, the public, other students and staff, and on the public's trust in the profession (David & Ellson, 2015).

Aims: FtP investigations can be resource intensive in terms of staff time so the aim of this work was to establish the real financial cost of a 'typical' FtP investigation that included an investigation and hearing.

Method: All allegations (academic years 2016-2019) that were accepted by the Faculty for investigation as potential breaches of FtP within professional codes of conduct were analysed. The cases judged to typically represent a range of issues that doubted the student's suitability to stay on the professional programme and therefore register with a professional regulatory body, were chosen. The representative cases were: (i) Unprofessional behaviour (First year student, Adult Nursing); (ii) Dishonesty/plagiarism by cheating in exams (4th year student, Pharmacy); (iii) Dishonesty by misrepresentation of driving offence (2nd year student, Pharmacy); and (iv) Persistent inappropriate behaviour (First year student, Adult Nursing). Case (ii) required two hearings as a result of a successful appeal and case (iv) reconvened the hearing since further information was required.

Results: Of the 29 total allegation cases presented to the FtP Faculty Lead (average 0.86% of eligible students per year), 25 required investigation by an Investigation Officer, and of this number, ten required a FtP hearing in order to conclude the case. From records, the time for each university staff member to undertake various tasks was estimated and used for middle of scale staff cost calculations with added overheads. The total staff time for each case was (i) 141 hrs., (ii) 219 hrs., (iii) 105 hrs., and (iv) 102 hrs. and this yielded an estimated average cost of £7471 per case. The average time spent by the Investigating Officer and Chair of FtP/Appeal Panel for each case was 35 and 21 hours respectively and each hearing required between 30 and 48 hrs total staff time.

Conclusion: Pharmacy students must spend a significant time in practice environments to develop competence in providing care to patients and the public, to a level required by the General Pharmaceutical Council to register as a pharmacist. FtP, as with qualified health professionals, is essential to safeguard patients, the public and the professions. The results of this study will contribute to a deeper understanding of staff time resource allocation with respect to FtP incidents and raise awareness of the importance of improved prevention strategies and interventions in professional programmes to raise standards and minimise the occurrence of prolonged expensive FtP cases. .

References

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98: Telling things: Ethnography of pharmacy university students' recipe-like science laboratory classes

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Background: Recipe-like science laboratory classes continue to be a major component of undergraduate pharmacy training despite the educational literature persistently questioning their effectiveness (Kirschner & Meester, 1998). These type of laboratory classes are distinct from lectures as they bring pharmacy students into contact with apparatus, materials and processes that are used to understand the science of pharmacy practice, but the virtues of these interactions and how they facilitate student learning is not completely understood.

Aims: The aim of this work was to explore student interactions with the non-human entities in traditional 'recipe-like' laboratory M.Pharm. science practical classes.

Method: Students' talk and action was recorded with a tripod-mounted video-camera and two wireless lapel-microphones in six classes over a period of 12 weeks (University ethical approval was granted). Audio transcriptions and videos were used by the authors/analysts working independently to thematically analyse the data. The analysis themes were presented as a series of episodes. Each episode was documented through a written commentary, a description of students and teachers in the episode, the action and *verbatim* transcripts of speech.

Results: The episodes drawn out from the observational data were entitled: 'Telling' weights and volumes; 'Telling' with machines and indicators; Telling qualities; and Telling on the surface of the product. Each episode emphasised the process of 'telling', which described how students mobilised solvents, creams and emulsion-types, in order to learn how to distinguish their properties. Telling included not only talk, but actions, which led to new understandings of the materials being used. The episodes demonstrated that the recipe-driven practicals did stimulate student learning, but this learning occurred as a consequence of the students's apprenticeship in the material properties of chemicals, the laboratory apparatus and scientific equipment that they employed during their laboratory work.

Conclusion: The recipe-like pharmacy laboratory practicals were a rich learning environment. The classes gave the students an apprenticeship to non-human entities, *e.g.*, solvents, creams and emulsions, that underpinned the science of pharmacy. These entities taught students in ways that were not possible in the lecture theatre.

References

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