Pharmacy Education (2025) 25(1) 273 - 282
https://doi.org/10.46542/pe.2025.251.273282

RESEARCH ARTICLE

Development of an integrated pharmaceutical chemistry laboratory on suspension dosage formulations with a pharmacist role-play in patient counselling, supply, and product recall

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Keywords
Counselling
Education
Laboratory
Pharmaceutical formulation
Pharmacist
Role-playing

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Abstract

Background: An educational activity was developed that combines a pharmaceutical chemistry laboratory with pharmacist role-play. **Methods:** Students prepared three paracetamol suspension formulations, then measured and drew conclusions on the stability of each formulation when select ingredients were omitted. Each student then undertook a role-play where they were required to counsel a parent requesting paracetamol for their child, supply the medicine, and then undertake a recall of the product and explain why it was recalled. Students' knowledge was tested through four multiple choice questions in their end of semester exam. **Results:** Collectively, the students' results demonstrated that removing viscosity-enhancing ingredients from the formulations caused the particles to settle faster. For the role-play exercise, just over half of the students made at least one mistake, with some supplying the wrong medicine or recommending the wrong dose. The exam results showed students understood the role and impact of key ingredients in a suspension formulation and could make general over-the-counter supply recommendations based on the scenario of the role play. **Conclusion:** This integrated laboratory-based counselling activity is a way to integrate pharmaceutical chemistry with practice which allows students to apply scientific knowledge in the context of supplying an over-the-counter medicine.

Introduction

The basic training of pharmacists includes knowledge and application of fundamental scientific concepts to enable effective and competent clinical pharmacy practice. To understand drug molecules and how they are formulated, students need competency in chemistry, while knowledge spanning biology, physiology, and pharmacology is required to understand what happens to drugs after they are administered. Often the science of pharmacy is taught separately from pharmacy practice. Degree programmes will often comprise courses, modules, or units of study that individually focus on either science or practice. However, the focus on building fundamental scientific knowledge at the start of a pharmacy degree comes at the expense of student satisfaction, with many feeling that there is too much emphasis on science and not enough on practice (Jesson *et al*., 2006). One way to alleviate this problem is through integrated curricula that combine science with practice. In the medical education literature, it has also been proposed that interdisciplinary integration is required in order to produce creative thinkers (Benor, 1982). Also, students generally do not understand the relevance of the science in their pharmacy degree (Prescott *et al*., 2014; Taylor *et al*., 2022). By exploring the applicability of scientific concepts in everyday

situations, students can better appreciate the significance of what they are learning and why.

Integrated curricula have been proposed and implemented in medical education since 1969 (Rosse, 1974). However, the effectiveness of integrated curricula in producing superior graduates remains debated, with concerns raised about potential superficiality (Smith, 2005; Husband *et al*., 2014). Despite these concerns, many countries, including the US, Canada, and the UK, mandate the use of integrated curricula in their pharmacy accreditation standards (Pearson & Hubball, 2012; Husband *et al*., 2014). Integrated curricula can take on three different forms. Horizontal integration is where content and themes across disciplines are brought together; vertical integration is where content is brought together across courses and connected to practice; and spiral integration incorporates both vertical and horizontal integration but also builds in complexity as students progress in their studies (Sun *et al*., 2023).

It has been shown that, when it comes to the attitudes of pharmacy teaching staff, most have positive perceptions of the implementation of integrated curricula, although a barrier includes pharmaceutical chemistry staff seeing integrated curricula as being too practice-orientated. Integrated curricula also take more time and effort to develop and coordinate, and there is the potential to introduce inefficiencies through the overlap and repetition of teaching (Alrasheedy, 2020). One study on attitudes to the use of integration found that a clear rationale needs to be given to staff for change integration and that better application of the theory of integration to teaching practice is needed to ensure standards are maintained when it comes to accreditation (Mawdsley & Willis, 2018).

There has been some research into integrated curricula in pharmacy. Mawdsley and Willis have shown that pharmacy students find horizontal integration useful as it helps them to understand how to apply practice from science and gives them context (Mawdsley & Willis, 2019). Malhotra *et al*. found that foundational practice and pharmaceutical chemistry are not diluted if they are integrated with clinical sciences and that barriers to integrated curricula can be overcome if content is developed using constructivist pedagogies such as team-based learning and simulations (Malhotra *et al*., 2021). There is also a growing number of case studies exploring the use of integration in pharmacy education, with mixed results. Hsia and colleagues (2023) compared student performance and perceptions of learning in neuropsychiatric and infectious disease courses between integrated and conventional curricula for US pharmacy students. While outcomes were initially worse for students in the integrated curriculum, the differences decreased at follow-up, and the student outcomes across both groups in objective structured clinical observation assessments and a delayed examination were similar. Islam and Schweiger (2015) report positive student feedback to the integration of medicinal chemistry, pharmacology, and pharmacotherapeutics in another US degree programme, with students in later years better appreciating the benefits of integration when compared with those earlier in their studies. Finally, Nezhad and colleagues describe the successful implementation (i.e. improved clinical decision-making skills and positive student feedback) of an integrated respiratory disease course for final year pharmacy students in Iran (Nezhad *et al*., 2024).

At the University of Sydney, a new Bachelor of Pharmacy curriculum was developed that incorporates science and practice integration throughout the degree programme. The aim of this paper was to describe the development and implementation of a new educational activity that integrates a pharmaceutical chemistry laboratory (team-based learning) with pharmacist role-playing (simulation) that involves patient counselling, supply, and product recall elements (Figure 1). The authors describe the tasks the students undertook and how they performed in each element of the activity, as well as their performance on exam questions that were directly related to the education activity.

Methods

Students

Students enrolled in The University of Sydney Bachelor of Pharmacy (BPharm) units of study (UoS) PHAR1822 - Physical Pharmaceutics and Formulation A and PHAR1921 - Pharmaceutics and Pharmacy Practice, and the graduate entry degree Master of Pharmacy (MPharm) first-year UoS PHAR5714 - Pharmaceutics and Formulation, undertook the learning activity. Prior to the activity, students were given two lectures which covered the theory and science behind suspension-based dosage forms, including the importance of ingredients that give products physical stability, one lecture on the reasons and processes of product recalls in Australia, and a series of lectures and tutorials on patient counselling and the supply of over-the-counter medicines.

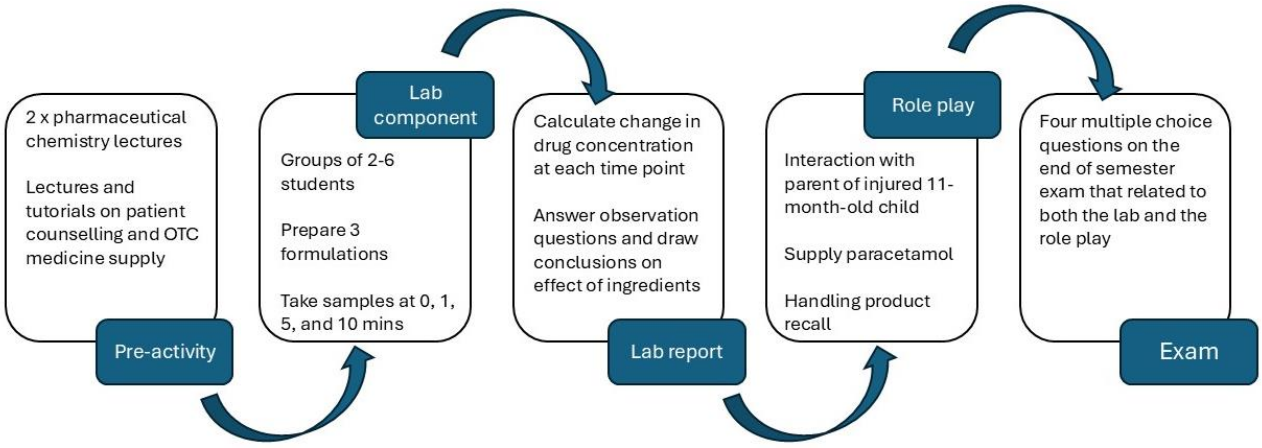

Figure 1: A schematic diagram that illustrates the tasks and activities undertaken by the class and the methods used for summative assessment.

Suspension formulation testing

In groups of between 2 and 6, the students were required to prepare three formulations of a paracetamol suspension product as per Table I. Clear step-by-step instructions were provided to the students in the form of an activity manual (Appendix A). The manual included links to explanatory videos on how to mix the formulations and how to operate the spectroscopic equipment. Each group of students prepared three paracetamol suspension-based products at a drug concentration of 50 mg/mL. Formulation A included all ingredients, but formulation B was missing the ingredient carboxymethylcellulose (CMC), and formulation C was missing the ingredient syrup (66.7% w/w glucose in water). Both ingredients are important to the formulation as they reduce the rate at which paracetamol drug particles settle in the container and, therefore, provide physical stability to help ensure a consistent dose after shaking. With these ingredients missing the paracetamol concentrations in formulations B and C are expected to drop faster over time when compared with formulation A.

Table I: The three paracetamol suspension formulations required to be prepared and tested by the students, with a key ingredient omitted in formulations B and C

Formulation A	Formulation B	Formulation C
25 mL water	25 mL water	25 mL water
25 mL CMC solution	25 mL CMC solution	—
25 ml syrup solution	—	25 mL syrup solution
1 mL hydroxy benzoate	1 mL hydroxy benzoate	1 mL hydroxy benzoate
5 g paracetamol	5 g paracetamol	5 g paracetamol
Make up to 100 mL with water	Make up to 100 mL with water	Make up to 100 mL with water

Students were required to take aliquots from the formulations at times 0, 1, 5, and 10 minutes and then undertake a double dissolution before the samples were analysed by UV spectrophotometry. On collection of their data, the students were required to complete an activity report form (Appendix B).

For each ingredient used in the formulations, the students were required to select and circle, from a list of possible reasons, their purpose for inclusion in the formulation. Options included active pharmaceutical ingredient, solvent/cosolvent, viscosity, density, sweetener, and preservative. The purpose of this was to have the students reflect on why the ingredient was included in the formulation so they could link that back to the impact of it not being in the product. In this case, the syrup and CMC both function to increase the viscosity of the formulation. Therefore, their absence, which is the case for formulations 2 and 3 that the students prepared, would mean the products would be less physically stable, and the paracetamol would settle in the container faster. By asking this question, it also helped to highlight to the students that ingredients can

have more than one role in a formulation, e.g. syrup as both a sweetener and to modify viscosity.

After completing the calculations from their data, students were required to answer three questions. The first question was, "*Visually, which formulation performed best?*". This question was asked because even though the students could have quite variable data when it came to the measured UV absorbance and paracetamol concentration, there are clear visual differences in how much each formulation settles. From visual inspection, the students can draw for themselves useful observations, such as that formulation A (which had no missing ingredient) could be visually seen not to have settled as much as the other formulations by the 10-minute mark.

The second question was, "*What would be the consequence of not adding either the CMC or syrup to the formulation during manufacturing?*" This question was asked to make students reflect on their UV and visual data to establish a link between the formulation stability and the role the ingredients play in the product. The final question, "*What is the maximum amount of time you would recommend to a parent that they can leave a bottle of the formulation after they have shaken it before it needs shaking again?*" was asked to make the students reflect that for formulation A, which had no missing ingredients, it still settles in a relatively short period of time, and therefore it is necessary to re-shake a suspension formulation after it has been sitting for just a few minutes.

Counselling, supply, and recall role-playing

After completion of the laboratory component, students were then required to individually undertake a role-play exercise where they took on the role of a pharmacist in the community setting and a member of the teaching team portrayed the parent of a young child. Within their explanatory manual for the activity, the students were provided with the following information to help them prepare:

> *The scenario is that the customer's baby, who is 11 months of age, was knocked over while they were playing in the shopping centre and has a large scrape on their leg. The baby's leg has been hurting since it happened 10 minutes ago. The baby has no medical conditions and isn't on any other medications. The parent has come to your pharmacy in the shopping centre to buy a bottle of children's paracetamol suspension to help with the kid's pain. When you supply the medication to the parent it will be important for you counsel them on the need to shake the bottle before use.*

During the counselling session, the students had three Children's Panadol (paracetamol) branded suspension products of varying concentrations to choose from to provide to the parent (1 month-1-year: 100 mg/mL, 1-5 years: 24mg/mL, and 5-12 years: 48 mg/mL) If asked, the students were told the baby's weight was nine kilograms.

Students were scored on seven criteria for asking probing questions essential to gaining background information to inform their product selection and recommendation and on two criteria for selecting the correct product and the advice they gave the parent.

Product recall

After counselling and supplying the paracetamol product, the student was then provided with a properly formatted, hard copy Australian Therapeutic Goods Administration (TGA) recall notice (Appendix C) for the product they had previously supplied. Under the reason/issues section of the notice, the key information that the student, acting as the pharmacist, had to read and interpret was:

> *Consumer Level Recall of the GlaxoSmithKline brand of Paracetamol Children's suspension and elixirs, due to the missing excipient carboxymethylcellulose, posing an under-dosing and over-dosing hazard for young children in the event this issue is not identified by the user.*

The student was then required to (1) explain to the parent why the product was being recalled, (2) explain the impact of the missing excipient, and (3) suggest an alternative product. Where a student used technical language during the recall explanation, which would likely not be understood by a typical patient or customer, this was noted by the staff member during the role-playing exercise, and the words or terms used were recorded on the assessment sheet. Finally, students were asked if they could recommend a different product for the baby, given the Panadol brand was no longer available due to the recall.

Formative assessment of learning

All assessments of the students' performance during the class (i.e. quality of their laboratory data and their performance in the counselling, supply, and recall role-playing) were formative only. Their performance in the activity did not contribute to their final mark or grade for the UoS. At the end of the role-play, the students were provided immediate feedback on how they performed regarding their probing questions of the patient to gain relevant background information (e.g. open vs closed questions), decisions and explanations (including the appropriate use of terminology), and

their general communication skills (e.g. tone and eye contact).

Summative assessment of learning

As an additional method for assessing whether students had achieved the learning outcomes of the activity, the students were asked four multiple-choice questions within their end of semester final exams. These questions were:

(1) What role does the ingredient hydroxybenzoate play in the formulation of a paracetamol suspension formulation?

(2) If the ingredient carboxymethylcellulose was accidentally left out of a paracetamol suspension formulation when it is being manufactured, what would be the likely impact?

(3) If a parent came to your pharmacy requesting a paracetamol suspension product for their 11-month-old baby that had just scrapped her leg, would you dispense the product? The baby has no medical conditions and is not on any other medication, and

(4) When supplied as a paracetamol suspension formulation where the medium is water, what physical state will the drug be in?

During the class, students were advised that there would be questions in the exam relating to both the laboratory and role-play components of the activity.

Results

Time taken to complete

In total, 266 students undertook the activity. For both the BPharm and MPharm cohorts, a three-hour time slot was allocated to complete both the laboratory and role-playing components. The average time taken to complete the class was 1 hour 45 min. While both cohorts of students had minimum times to completion that were roughly the same (1 hour 9 min), the larger class size of the undergraduate sessions (~40 students per session) meant that their longest time to completion was 3 hours 15 min when compared with the postgraduate students (~25 students per session) who had a maximum time to completion of 2 hours 22 min. The biggest factor in how long it took students to complete the class was the number of staff available to facilitate the role-play component. With two staff members available to conduct the role-play, there were often queues of students waiting to take their turn. Interestingly, it was observed that many of the students used the waiting time to practice the role-play with each other. When three staff members were available, the time a student had to wait was much shorter, and in some instances, there were no queues for the role-playing.

Formulation stability data

The average values recorded for the change in paracetamol concentration for each formulation over a 10-minute period recorded by both the BPharm and MPharm cohorts is given in Table II. As expected, their results show clear trends, where the paracetamol concentration drops over time and drops faster for the formulations that are missing key stabilising ingredients. However, there was large variability between groups in their results. Instead of a decrease in concentration, some groups reported increases as high as 403%. Some of these groups reported continually increasing concentrations of paracetamol with time, while other groups reported results where their concentration of paracetamol went up and down with time.

Table II: Average decreases in paracetamol concentration reported, when compared with time zero, on the laboratory forms across both the BPharm and MPharm cohorts.

Formulation	Decrease in paracetamol concentration (%)					
	BPharm			MPharm		
	1 min	5 min	10 min	1 min	5 min	10 min
A	26	37	41	7	19	40
B	28	36	51	24	48	59
C	40	49	52	41	58	60

Patient counselling

The results of how the students performed in the role-playing exercise are given in Table 3. In selecting a product for the parent, each student had three Panadol branded paracetamol suspension-based products from which to select. Despite most students (n = 105) asking

the age of the baby, and being told 11 months, some students (n = 16) selected a 1 to 5 years branded product. The result of this was that those students then typically recommended a much higher, potentially unsafe, dose of 3 to 8 mL to the parent, as there was no guidance on the packaging for a child younger than one year old. The guidance on the packaging for 1 month to 1 years, based on weight and age, recommended a dose of 1.2 to 1.5 mL.

When explaining the reason behind the recall, many students used terminology that would be considered inappropriate when communicating with the public. Examples of terms and words used by the students included those not likely to be understood by the parent (e.g. excipient, homogenous, or carboxymethylcellulose) or were too vague (e.g. they mentioned stability, that there was a missing "*element*", or that there was "*interference with the dose*") or made statements that were incorrect (e.g. that there was an active ingredient missing, that the product contained crushed tablets, the product would not work efficiently, or that the child could choke).

As part of the role-play, students were asked if they could recommend a different but suitable product for the child, given that the Panadol branded product was recalled and not available. Suitable recommendations were made by 89% of the students and included recommendations of a generic brand of paracetamol, referring specifically to a different branded product of paracetamol (Dymadon, Tylenol, or Panamax), or ibuprofen or a branded product of ibuprofen (Nurofen), and one student recommended a suppository formulation of paracetamol. Some students were not able to recommend a different product, or they suggested an inappropriate product such as Dimetapp (a branded cough and cold product), aspirin, or a branded product of diclofenac (Voltaren).

Table III: Percentage of students who forgot to ask a probing question, made a mistake in supplying the medicine, who forgot to give advice regarding the use of the medicine, or had difficulty explaining the scientific reason for the product recall

Task	Percentage errors or mistakes	
	BPharm	MPharm
Made at least one mistake during counselling, supply, recall	52	58
Counselling		
Didn't introduce themself	0	0
Didn't ask who the medicine was for	0.4	0
Didn't check the age/weight of the baby	2	3
Didn't ask about symptoms	8	19
Didn't ask if the child had any medical conditions	16	22
Didn't ask about allergies	7	8
Didn't ask about other medications the child was taking	19	19
Supply		
Supplied the wrong medicine/advised wrong dose	5	11
Didn't advise to shake bottle before use	11	13
Recall		
Couldn't explain why the product was being recalled	2	4
Couldn't explain the impact of the missing ingredient	15	4
Couldn't recommend a suitable replacement product	11	8
Used unsuitable terminology when explaining the recall	38	57

Examination

Each student responded to four multiple-choice questions on their end-of-semester exams. The undergraduate students demonstrated better knowledge of the purpose of hydroxybenzoate as an ingredient in pharmaceutical products, but the postgraduate students outperformed in two questions that required the application of knowledge (Table IV). These questions related to the impact of a missing ingredient and the physical state of the drug in the formulation.

Table IV: Results of the number of students who answered each multiple-choice question correctly in the end of semester exam for both the BPharm and MPharm student cohorts

Question	Percentage of correct answers	
	BPharm	MPharm
What role does the ingredient hydroxybenzoate play in the formulation of a paracetamol suspension formulation?	76	55
If the ingredient carboxymethylcellulose was accidently left out of a paracetamol suspension formulation when it is being manufactured, what would be the likely impact?	51	60
If a parent came to your pharmacy requesting a paracetamol suspension product for their 18-month-old baby that had just scrapped her leg, would you dispense the product? The baby has no medical conditions and is not on any other medication.	68	57
When supplied as a paracetamol suspension formulation where the medium is water, what physical state will the drug be in?	29	36

Discussion

In this paper, the authors describe an educational activity that combines a pharmaceutical chemistry laboratory with a pharmacist role-play exercise to demonstrate to the students the application of the science that underpins the formulation of suspension dosage forms and the corresponding counselling advice offered to patients/carers. Importantly, the authors demonstrate the feasibility and scalability of the implementation of this activity in both the smaller MPharm and larger BPharm cohorts and highlight the value of integrating science and practice in a combined learning activity.

This activity is a horizontally integrated activity whereby content and themes across disciplines are brought together in a single activity (Sun *et al*., 2023). Here, students investigated the science of pharmaceutical suspensions by making and testing three different formulations. They then applied what they had observed to the advice provided to patients when counselling on over-the-counter products and responding to product recalls. Importantly, this brings together content either from different parts of an individual UoS (for BPharm students) or different UoS taken in the same semester (for MPharm students). Our results suggest a positive effect on students' understanding of the role of different ingredients in a suspension formulation and the impact of removing these ingredients from a formulation, as well as the ability to apply this in the advice provided to patients.

In the role-play exercise undertaken by the students, they were required to explain to the patient that their product had been recalled and why (i.e. due to a missing ingredient) as well as the impact of the missing ingredient. The ingredient was CMC, which relates directly to the formulation B product that the students had prepared and tested in the laboratory component of the activity. The impact of the missing ingredient was that the viscosity of the suspension decreased, which resulted in the paracetamol settling faster. The outcome of this is that the dose drawn by the patient would likely be significantly impacted. When the bottle is new, the patient is more likely to draw a dose that is too low (so not effective), and as the contents are used and little remains, they are likely to draw a dose that is too high (potentially unsafe).

From our analysis of the student role-playing performance, most students (>95%) were able to explain that the product was being recalled because of a missing ingredient, and the majority could correctly explain what the impact would be on the product (85-95%) hence, showing their application of the science of the activity. Meanwhile, more than half of the students correctly answered exam questions related to the role of ingredients in the suspension and the impact on the product if these are left out. This is consistent with a study by Mawdsley and Willis (Mawdsley & Willis, 2019), which explored English pharmacy students' perceptions of integrated pharmacy curricula, with students reporting that they found horizontal integration useful as it helps them to understand how to apply underpinning scientific principles to practice and provides context for the pharmaceutical science that they are learning.

A key skill of a practising pharmacist is the ability to effectively communicate with a range of different people, from healthcare professionals to patients. The ability to communicate with patients is especially important as effective communication has been shown to improve patient compliance and reduce mistakes with their medicines (Ali *et al*., 2003). As such, a student's ability to adapt how they communicate with different people is important. While it may be appropriate to use technical language with a medical doctor or nurse, explanations to patients need to be made using common and simple language, as patients can often misunderstand medical terminology (Gotlieb

et al., 2022). Cultural differences are also important. Studies (such as Levin, 2006) have shown that medical terms can be interpreted in different ways by different cultural groups. This is particularly relevant for our student cohort, where over 75% speak a language other than English at home. It has also been shown that communication skills can be developed in students through patient counselling sessions, either under the supervision of a preceptor in the real world (McDonough & Bennett, 2006) or via simulated (role-playing) interactions.

While the majority of our students were able to explain why the product was being recalled and the impact of this on product performance, many had difficulty in using patient appropriate explanations that did not include technical language. Just over a third of the undergraduate students and over half the postgraduate students used technical language during patient counselling. However, the results are not surprising, given the level of pharmacy development of both cohorts. Students often make mistakes (Chuang *et al*., 2021) and have difficulty communicating early in their training. This class activity was undertaken in a UoS in the first year of their respective degree programmes. For many students, this was their first time undertaking a role-play, and their competency is expected to increase over the course of their pharmacy degree studies.

Students were also found to have quite variable data when it came to the calculated percentage that each formulation had settled by at each time point. Anecdotally, the authors noticed that groups that tended to finish first had poorer results than groups which took their time, but the authors do not have data to conclude that the poor results are simply due to student effort. While students were informed at the start of the class to always ensure that they drew aliquots from the formulations at the same depth to ensure consistent results, it was observed that students were not always careful to do this. There may be other explanations for the variable results. For example, a factor that may have contributed to the variability in the students' results may be the particle sizes of the paracetamol in each formulation. Even after 10 minutes of shaking, some samples still had large clumps of paracetamol particles, while other samples did not. This factor could potentially be eliminated through the incorporation of ultrasonication of the formulations once all ingredients had been added to the container, as this would break larger clumps more effectively than by shaking alone. Alternatively, a wetting agent could be added to the formulation. The purpose of the wetting agent would be to coat the paracetamol particles and reduce their propensity to stick together. Some surfactants have been demonstrated to be good wetting agents for paracetamol particles and could be easily and cheaply added to the formulation described in this paper (Simons *et al*., 2005).

The quality of the formulation data generated by the students was not unexpected, given their limited experience in the relevant lab techniques. However, in order to address concerns from pharmaceutical chemistry staff who may see integrated curricula as being too practice-orientated (Alrasheedy, 2020), it is essential that students are provided with opportunities to revisit this fundamental scientific content in different clinical contexts throughout their degree in order to adequately develop these skills. The use of a spiral integrated curriculum, whereby content and themes are brought together across disciplines and courses and connected to practice, with increasing complexity as students progress (Sun *et al*., 2023), is one way to achieve this.

Limitations and future directions

The analysis of this new integrated class activity is based on the results of students from a single calendar year cohort, and the results obtained by the students in the laboratory component and the performance of the students in the role-playing component may not be representative of students in other years. There is also no comparison group included here. This was because this was not seen as necessary to our aim of describing the development and implementation of the lab activity. Additionally, given the promising results of the intervention in developing students' knowledge of suspension formulations and the relevance of this to their future pharmacy practice, it was seen as unethical to not offer this intervention to all students (although the authors note that there are examples of controlled educational trials examining integrated pharmacy curricula, such as Nezhad *et al*., 2024). Future work using a historical control (e.g. examining performance on similar exam questions by students who did not complete this activity) could overcome this. Finally, our analysis focused on student performance in the lab activity and exam questions, and the authors did not examine how students or educators felt undertaking this activity or its perceived value to their learning. Further evaluation utilising both qualitative (semi-structured interviews and focus groups) and quantitative (e.g. surveys) is warranted to further refine the development of this learning activity.

Conclusion

In this paper, the authors have described the development of an educational activity on the topic of

suspension dosage forms that combines a pharmaceutical chemistry laboratory session with a pharmacist role-play. The students were able to produce formulations, complete calculations, and make observations on the effect of removing ingredients that decreased product viscosity. While many students made mistakes during the role-play by forgetting to ask probing questions, recommending the wrong product or dose, or using technical language that was unsuitable for communication with patients, the education activity serves to link the pharmaceutical chemistry of suspension formulations to the need for good counselling and instruction when supplying medicines to patients. This educational activity could serve as a template to develop similar integrated science and practice class activities.

Ethics approval

This study was approved by the Human Research Ethics Committee of the University of Sydney, approval number 2023/903.

Conflict of interest

The authors declare no conflict of interest.

Source of funding

The authors disclose no relevant funds or grants were received.

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