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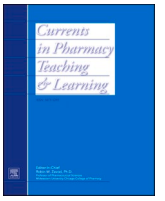

Dividing opinions - Reviewing the future calculation curriculum in pre-registration pharmacy technician teaching in England and Wales

Billy Smith *, Hannah Kinsey

School of Chemistry, Pharmacy and Pharmacology CAP 01.109), University of East Anglia, Norwich Research Park, Norwich NR47TJ, United Kingdom

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ABSTRACT

Introduction: Pharmacy Technician practice is continually evolving, yet many areas of the curriculum have stayed the same- including pharmaceutical calculations. This study aimed to review and discuss the teaching and examination of selected calculations within the Certificate in Higher Education in Pharmacy Technician Practice taught in England and Wales.

Methods: Qualified pharmacy technicians, who are current or previous educational supervisors to pre-registration pharmacy technicians, were invited to focus groups to discuss the teaching of four calculations previously highlighted as rarely or never used in the workplace by pharmacy technicians. The calculations discussed were moles, molarity, displacement values and dilutions. After discussing each individual calculation, participants voted to either: 1) continue teaching and examination 2) continue teaching and do not examine 3) remove from teaching/examination and teach as a post-qualification advanced course 4) remove from teaching/examination and do not teach in post-qualification. Voting results and transcripts from the focus groups were analysed using descriptive statistics and framework analysis.

Results: The participants, who were all hospital based, agreed that teaching of these calculations should be reconsidered. Most felt that they should be included as part of the scientific understanding for each concept rather than examined individually. There was no expectation that these calculations would be undertaken by newly qualified pharmacy technicians.

Conclusion: The evolution of healthcare practice means that certain calculations are no longer a routine part of modern pharmacy technician practice. We have highlighted that the teaching and examination of these should be reviewed and altered for future students.

Introduction

In 2005, the pharmacy regulator for Great Britain - the General Pharmaceutical Council (GPhC) – introduced the pharmacy technician professional register. Initially voluntary, registration was made mandatory in 2011. Since the introduction of registration, the role of the pharmacy technician has continued to evolve as changes in the health system expand the roles of healthcare professionals.[1,2] The increasing focus for pharmacists to provide more clinical services has led to the role of the pharmacy technician moving away from dispensing and medicine production to include patient-facing support, focussing on what the NHS terms “medicines

* Corresponding author.
E-mail addresses: Billy.Smith@uea.ac.uk (B. Smith), H.Kinsey@uea.ac.uk (H. Kinsey).

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optimisation".[1–4]

The changing face of healthcare means that there is a need to continually review and update the education and training standards to suit the modern pharmacy technician role.[5,6] The GPhC published new standards for the initial education and training of pharmacy technicians in 2017 to reflect these changes in practice.[7] One noticeable change in these standards, compared to the previous standards (published in 2010), is the absence of pharmaceutical preparation and aseptic production of medicines.[8] Extemporaneous preparation (also known as compounding) is a role that has reduced dramatically in Great Britain.[2,9] The role is now undertaken so infrequently that guidelines recommend further training should be undertaken and regularly updated to ensure that professional skills stay current.[10]

The role of calculations is vital to pharmacy technicians, being highlighted as a key standard and requirement for pharmacy technicians in many countries including the USA,[11] Canada[12] and UK[7]. This is reflected through the GPhC Standard 41 (2017) for "professional knowledge and skills" which states that pharmacy technicians should be able to "accurately perform pharmaceutical calculations to ensure the safety of people".[7]

Currently, there is no consensus as to exactly which types of calculations pharmacy technicians perform in practice and by extension, what should be taught to pre-registration pharmacy technicians (PTPTs).

The University of East Anglia (UEA) teaches PTPTs across multiple sectors- including hospital, community, mental health, health and justice, general practice, primary care, and armed forces. Calculations are taught as a standalone subject in the curriculum on a Certificate of Higher Education in Pharmacy Technician Practice course that was reviewed and accredited by the GPhC in 2020. Calculations taught are based upon a pre-existing curriculum, designed when manufacturing and aseptic preparation of medicines were part of the GPhC standards. The changing role of the pharmacy technician in Great Britain (reflected in the updated standards) makes it unclear if the previous curriculum reflects calculations now used in modern practice.

While there is little to no research based around teaching calculations to pharmacy technicians, there have been investigations in other professions. Research into teaching calculations to nursing students has highlighted the importance of teaching calculations that resemble those seen in clinical practice and are realistic for the healthcare professional involved, to provide the optimal context for learners studying calculations.[15,16]

Drawing from these lessons, when developing pharmacy technician curricula, it is important that the calculations taught and assessed for pharmacy technicians resemble those performed in practice by the profession.

In a previous survey[15] conducted with practicing pharmacy technicians across all sectors linked with the UEA course, four types of calculations were identified as being rarely or never used in the workplace by pharmacy technicians. The calculations found in this survey were:

- Working out the moles in a weight of substance (and weight of set moles)
- Calculating the number of moles in a volume of a set molarity
- Using displacement values to calculate the amount of base needed in suppositories
- Calculating the strength/volume of diluted substances

These results highlight the need to review the inclusion of these calculations in the PTPT curriculum as they may no longer be relevant to practice.

This is consistent with findings and recommendations from research in other health professions, which advocate that calculations taught in a curriculum should be both realistic and undertaken as part of practice.[13,14] It should be highlighted that a limitation of these results is that they were only for educational supervisors of pharmacy technicians undertaking the UEA course; educational supervisors

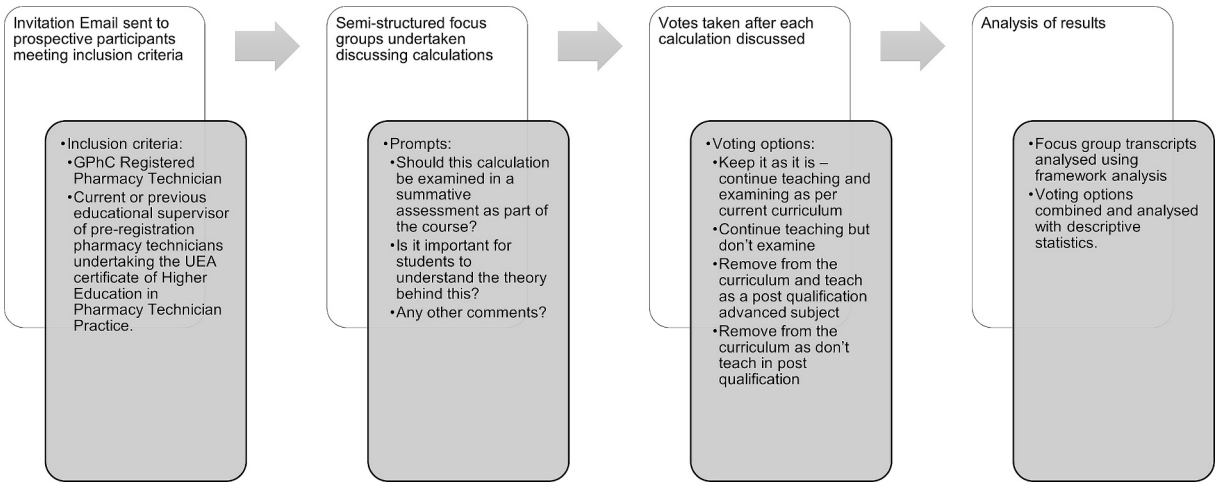

Fig. 1. Flowchart of planned approach towards the study.

for students undertaking training from other institutions may hold different views.

The aim of this research is to review the calculations identified as no longer a part of current PT practice and determine whether they should continue to be taught and/or examined as part of the UEA Certificate of Higher Education in pharmacy technician practice.

Method

Ethical approval for a qualitative study using focus groups was obtained through the UEA School of Education and Lifelong Learning research ethics subcommittee (ETH2223–0713). Recruitment, data collection and analysis were undertaken by the lead author (BS) with advice provided by the co-author (HK) and project support team (detailed in Acknowledgements). The approach to the study is shown in Fig. 1. The consolidated criteria for reporting qualitative research (COREQ) checklist was used to review and validate the design (see Appendix A).[16]

Recruitment

Purposive sampling was used to identify prospective participants meeting the inclusion criteria: GPhC registered pharmacy technicians acting as current, or previous, educational supervisors of PTPTs undertaking the UEA certificate. All prospective participants were invited via gatekeeper email (followed up one week later) to attend an online focus group, with the aim of creating three focus groups of four to six participants from multiple sectors taught within the course.

Data collection

Focus Groups were held on Microsoft Teams®, which was also used to record the session, and facilitated by the lead researcher (BS).

A semi-structured topic guide was used to facilitate discussions based on the four calculations identified through the survey described previously (calculating moles, molarity, displacement values and dilutions). Each calculation type was introduced alongside a worked example. Participants were then invited to discuss the inclusion of the calculation within the UEA PTPT curriculum. Prompts were used to encourage discussion around the use of the calculation within the workplace, the necessity of teaching the theory, and whether it was necessary to examine the calculation.

After discussing each calculation, participants were asked to vote whether each calculation type should continue to be taught and assessed. Voting consisted of four options:

A) Keep it as it is – continue teaching and examining as per current curriculum
B) Continue teaching but don't examine
C) Remove from the curriculum and teach as a post qualification advanced subject
D) Remove from the curriculum as don't teach in post qualification

Recordings and transcripts were produced using the online meeting platform and available to all participants for 28 days after the focus group. Transcripts were proofread for accuracy by the lead researcher (BS).

Data analysis

Data analysis was completed by the lead researcher (BS), with support from the co-author (HK). The seven stages of framework analysis[17] were followed: starting with initial transcript review (stage one), familiarisation (stage two), then coding of data into their

Table 1
Coding themes from analysis.

Theme	Subthemes
1. Dilutions	a. Teaching
	b. Examination
	c. Use in workplace
	d. Post qualification teaching
2. Displacement Values	a. Teaching
	b. Examination
	c. Use in workplace
	d. Post qualification
3. Molarity	a. Teaching
	b. Examination
	c. Use in workplace
4. Calculating Moles	a. Teaching
	b. Examination
	c. Use in workplace
5. General Comments	a. Types of calculations taught
	b. Approach to teaching calculations

associated sub-themes using deductive analysis (stage three). The analytical framework was developed using the aims and objectives of the study prior to data collection (stage four). The analytical framework where sub-themes were grouped into themes was applied (see Table 1, stage five), utilising NVivo® software to chart the data in the framework (stage six) before data interpretation (stage seven).

Voting results were tabulated in Microsoft Excel® and incorporated into Bar Charts using descriptive statistics.

Results

One hundred and one participants were identified and contacted, with ten expressing interest- all of whom were based in the hospital sector.

Two individuals who expressed an interest in participating later withdrew their interest since they were unable to attend any of the proposed dates. One further individual who expressed an interest had to cancel last minute due to a workplace emergency. Two focus groups were held, comprising of four and three participants respectively ($N = 7$).

Calculating moles

Both focus groups agreed that calculating moles was not used within the workplace:

"We wouldn't use it [mole calculations]. *They're not for technicians, I wouldn't have thought. It's not even used in our aseptic unit." PT6 (Theme 4d).*

This led to discussions on whether PTs still needed to have an understanding and background knowledge of calculating moles for their role:

"I don't think it's [mole calculations] *something that's used very often, but I don't see any harm in them* [PTPTs] *being taught it" PT3 (4d, 4a).*

When discussing the ongoing inclusion in the curriculum, participant opinions differed around the examination of the calculations. This was shown by the results in the poll- four out of the seven participants voted to continue teaching but not to examine, whilst the other three wanted to continue assessment (Results shown in Fig. 2).

Reasonings for the votes were varied. Some based the need to examine to support the knowledge:

"I think keep it [assessment] *as it is…I almost don't see the point of teaching it* [mole calculations] *if you're not going to then assess them* [PTPTs] *on it…you want to make sure that they've understood and have got the concepts that you're teaching." PT3 (4b,4a).*

While others thought the relative simplicity of these calculations means that it wouldn't be hard to examine:

"So like I think the basic ones [mole calculations], *it's just good to show they* [PTPTs] *have, you know, learnt new knowledge and paid attention" PT5 (4a).*

The participants that didn't want to assess the calculation did, however, discuss the need to teach it to ensure that students understand the underlying concept of moles. Feeling that it would be useful to understand this as pharmacy technicians will come across the term moles when working:

"I think it's good for them [PTPTs] *to have an understanding of moles because we* [the workplace pharmacy] *have... areas with fluid infusion bags, where people* [PTPTs] *have given one* [a fluid bag with set moles of a substance in] *they think might be appropriate but [they]*

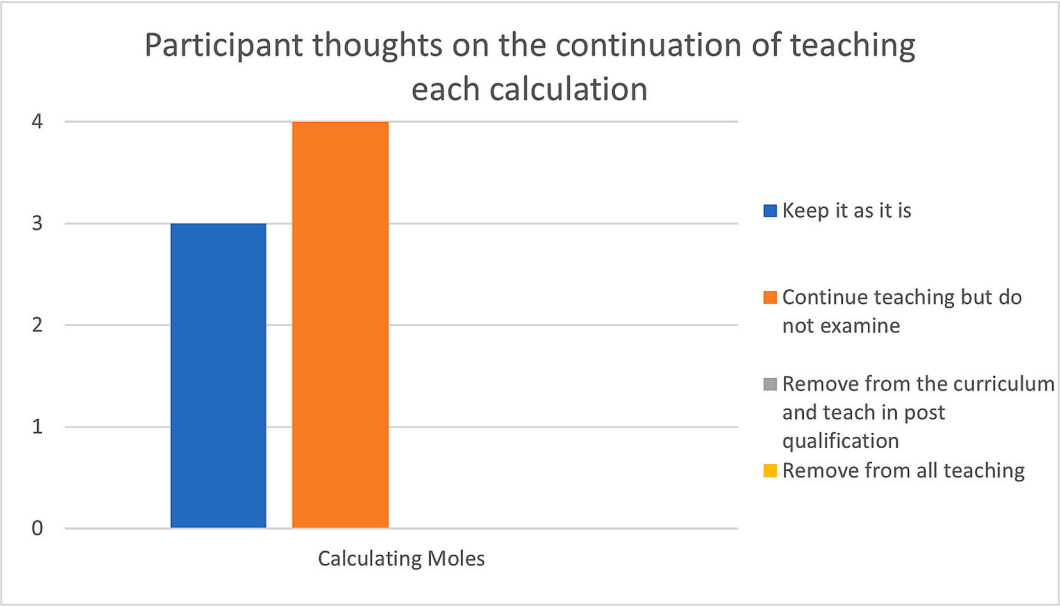

Fig. 2. Participant vote on continuation of calculating moles in the curriculum.

don't [need to] understand how moles work." PT2 (4a, 4c).

Further discussion led to the consideration of teaching this calculation within the scientific content around moles, rather than as a standalone calculations unit, to support student understanding of a concept that many struggle with. Participants felt that the teaching of this calculation encourages the student to focus more on equations rather than supporting their understanding of the concept.:

"Yeah, [including in the scientific content instead of calculations] *might be a bit more sense to them if it's* [mole calculations] *included in the chemistry side of things. "PT5 (4a).*

Molarity

When discussing molarity calculations, comparisons were made to calculating moles and their overall lack of use in hospital practice. There was further agreement that this type of calculation was not used in the workplace and should not be examined:

"In reality I don't know how many of them [PTPTs] *would go on to actually having to make stuff like this* [calculating molarity]*, so I'm not sure this is as relevant. "PT3 (3a, 3d).*

Opinion was split around whether the content should be taught in the current course or saved for post qualification learning for pharmacy technicians going into more specific areas. Within the voting, three out of seven participants thought it would be better as a specialist training:

"We [the workplace] *are not putting pharmacy technicians through production anymore at all and we're using the new science manufacturing technician course. So I wonder if this* [calculating molarity] *is more relevant to those trainees rather than the PTPT." PT3 (3a, 3d, 3e).*

The main consensus, however, was to keep the theory embedded with the science so that students can understand the concepts if they come across a molar concentration within the workplace. Four out of the seven participants voted to continue teaching but not examine (Fig. 3):

"great for them [PTPTs] *to have the theory. But in terms of assessing them* [on molar calculations]*, I don't feel like it's necessary" PT1 (3a, 3b).*

Displacement values

Displacement values had the largest variation of answers within the vote, with voting spread among all options (Fig. 4).

It was generally agreed that these calculations are no longer used in practice, with some mentioning that they had last used this calculation decades ago:

"I mean, I was a student in 2000 and I did them [displacement values to make suppositories] *but not proper ones. It was a like a teaching session I attended, but I've not seen them. We* [the workplace] *haven't made them* [suppositories] *for years here." PT5 (2c).*

Despite agreement that these are not used in practice, views regarding their inclusion in the curriculum varied. Some participants thought it would be better as a specific post qualification subject:

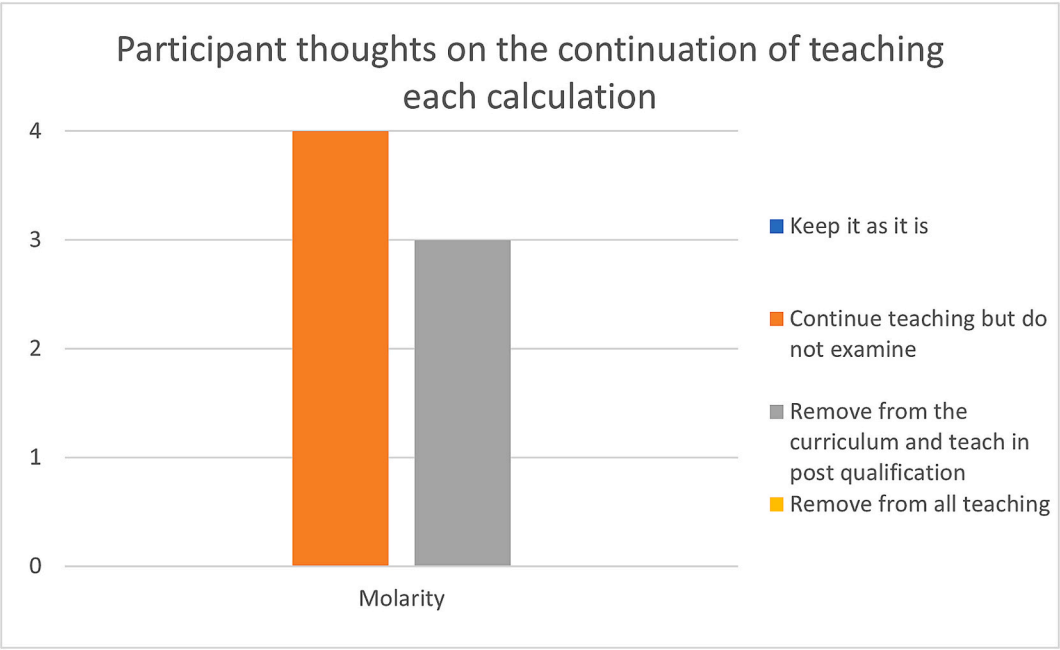

Fig. 3. Participant vote on continuation of molarity in the curriculum.

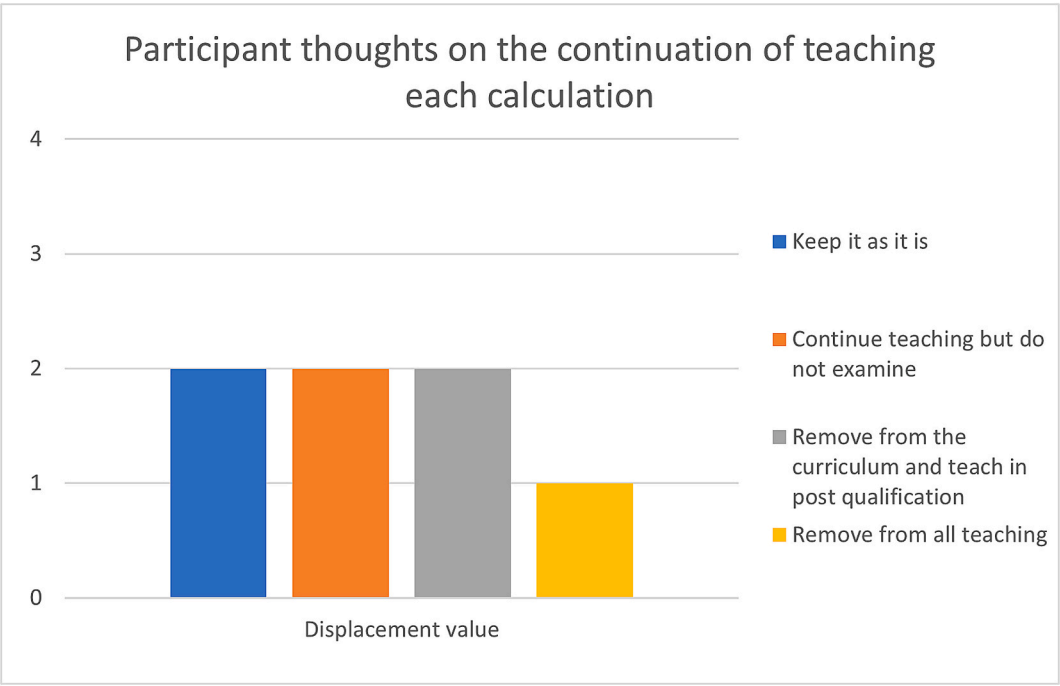

Fig. 4. Participant vote on continuation of displacement values in the curriculum.

"So I think if you were considering to teach [displacement values] *at all, it would have to be in a post qualification subject, but aimed at people working in the manufacturing industry." PT6 (2e).*

Others believed the theory would be an interesting and useful concept to teach to support an understanding and make up of suppositories:

"The theory might be useful because I don't understand myself why I would need to know the displacement value of a particular drug." PT1 (2a).

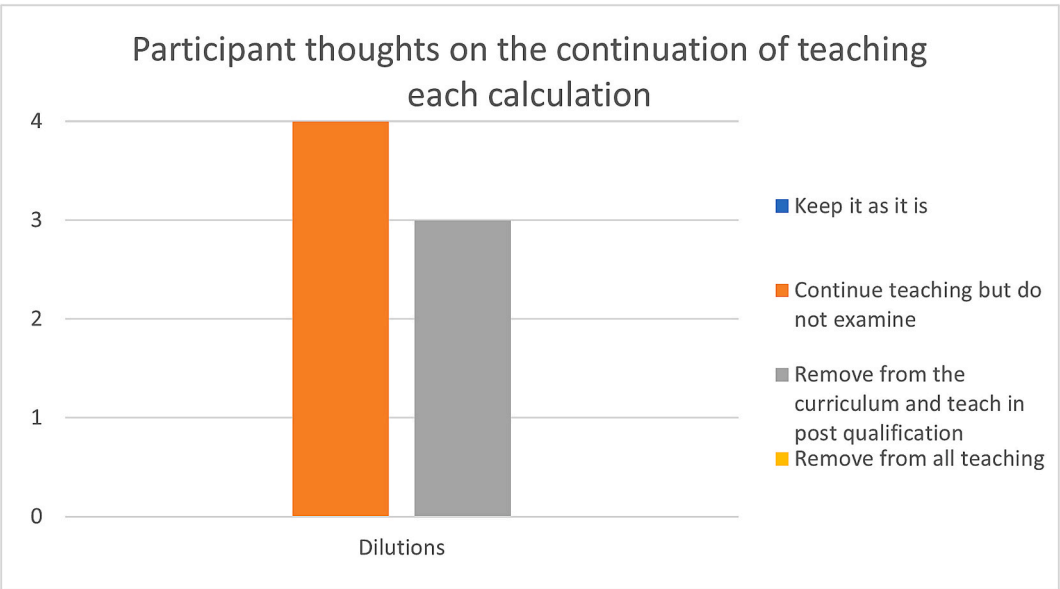

Fig. 5. Participant vote on continuation of dilutions in the curriculum.

Dilutions

Participants agreed that dilutions were no longer used in the workplace:

"We [pharmacy technicians] don't make anything here at all, apart from staff in the aseptic unit, but they [the aseptic unit staff] *wouldn't even use that [dilution] calculation." PT6 (1d).*

The main discussion was based around whether the theory should be taught within the curriculum and not examined or kept for post qualification learning. Four out of the seven participants thought it would still be worth teaching (Fig. 5):

"… maybe teaching it [dilutions] *as part of just exploring the different types of calculations that you can get in the field* [wider pharmacy and manufacturing] *is great, but not to be examined" PT1 (1a).*

General comments

After reviewing all calculations, participants were offered the chance to provide any further comments around the current curriculum, the use of calculations within their practice and the future of the UEA PTPT curriculum.

Many comments were provided regarding the role of the calculations in hospital practice. Participants described the change in practice from manufacturing to patient facing, with manufacturing style calculations being used much less in practice and outsourced to specialists. This was also linked to the thought that teaching calculations which are not used in practice will be harder for the students to remember and use appropriately:

"It's just this [the calculations discussed] is all just manufacturing related. Unfortunately, most manufacturing units [in hospitals] are getting smaller and smaller. You can buy everything in from ready-made companies." PT7 (5).

"I think it [calculations taught] *needs to be relatable because otherwise they're* [PTPTs] *not going to remember it. Not gonna be able to use [this knowledge]" PT6 (5).*

Other comments focused on the need to teach calculations and the relative complexity of what is taught; proposing that the basic concepts should be taught to all PTPTs, while more complex equations or specialist areas can be accessed through further study and reading if desired:

"I think they [PTPTs] *need to know maths, they need to be able to do calculations, but some of them* [the calculations currently taught] *I think are quite involved and probably maybe a little bit more than they* [PTPTs] *need." PT3 (5).*

Discussion

The focus groups highlighted that many pharmaceutical calculations related to the manufacture of medicines are rarely, if ever, used in current hospital pharmacy technician practice. Research has shown the development of the pharmacy technician into a more patient focussed role with more involvement in medicines optimisation in many sectors.[3] Participants have echoed the conclusions from previous research in nursing students on the need for realistic calculations based on clinical practice to support learning.[15,16] Consensus was that learners who do not do the calculations day-to-day will find it hard to remember for examinations.

Discussions in the focus groups highlight that educational supervisors feel that that the selected calculations do not require examination as they are not used within the workplace. It was generally accepted that an overview of the calculations would still be useful in the curriculum to support understanding of the scientific concepts involved.

Inclusion criteria was designed to ensure that participants with good understanding and experience in multiple sectors were recruited. Unfortunately, the low number of participants ($n = 7$) and singular sector of work (hospital) means that the views provided may not represent the views pharmacy technicians across all sectors. Further research using educational supervisors outside of the UEA course could provide a wider picture of practice.

Conclusions

The changing landscape of pharmacy practice has meant that certain calculations are no longer used in everyday practice. Within focus groups, four previously identified types of calculation were discussed (calculating moles, molarity, displacement values and dilutions). Participant comments confirmed that these calculations are not routinely used in hospital practice and consensus was that they should not be assessed as part of the UEA PTPT curriculum.

Results highlight that the theory associated with calculations still has a role in supporting student understanding of scientific and pharmacological concepts discussed. Consensus is that the calculations taught could instead be embedded within the scientific content-supporting student understanding. This would allow learners with a better concept of mathematics to research further into the calculations if desired. This approach would then reduce examination burden on students who struggle to perform calculations which are not used in their everyday practice.

This research has determined that the UEA PTPT curriculum requires revision and alteration to provide an up to date and appropriate education for PTPTs. Further research will be required to consider the impact of these changes especially in relation to other areas of pharmacy technician practice taught by the UEA- and to review the use of other calculations which may need adding or removing from the curriculum. The outcomes of this can be presented to the GPhC to influence future changes of the calculations curriculum in PTPT education.

Contribution to literature

The teaching of pharmaceutical calculations to pre-registration pharmacy technicians has had little research historically. Changes in practice mean that pharmacy technicians in Great Britain have very different roles in the modern day compared to the 20th century. We have concluded that four types of calculation have little role in general hospital pharmacy technician practice. This research has highlighted that calculation curriculum needs reviewing to reflect modern day practice. The consequence of this is that there will be significant changes to the types of calculation taught and examined to support pre-registration pharmacy technicians to prepare for modern practice.

We believe that this research will contribute to the discussion of the future of the wider curriculum for both pharmacy technicians and pharmacists. With the evolution of the profession there are many more subjects requiring teaching. This research highlights how some areas of the curriculum may no longer be necessary and could be reviewed to allow more time spent on teaching the appropriate curriculum.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. COREQ Checklist review

COREQ checklist criteria[16]	Team response
Domain 1: Research team and reflexivity	
Personal Characteristics	
1.Interviewer/facilitator	Lead author (BS) confirmed within report. Below information on author profile.
2.Credentials	*MPharm, PGDip (clinical pharmacy practice), PGCert*
3.Occupation	Lecturer/online learning and development lead
4.Gender	Male
5.Experience and training	Content designer and lecturer on course. Conducted previous surveys on calculations use. Undertaking training on *PGDip in higher education*
Relationship with participants	
6.Relationship established	Known through course teaching (lecturer of course and educational supervisors of students on the course).
7.Participant knowledge of the interviewer	Participants aware of interviewer's goals and reasons for doing the study through participant information sheet agreed through ethics committee
8.Interviewer characteristics	Detailed above. Lead interviewer is a member of staff on the course and so biases were discussed in ethics submission- scripts were prepared to prevent influence of results.
Domain 2: study design	
Theoretical framework	
9.Methodological orientation and Theory	Framework analysis- discussions within team of the approach
Participant selection	
10.Sampling	Purposive sampling and method described in report. Email sent to all existing ES's on course (101 in total).
11.Method of approach	Email via gatekeeper
12.Sample size	n = 7
13.Non-participation	Mentioned in text, two unable to attend any suggested times, one further participant had a last-minute emergency.
Setting	
14.Setting of data collection	Online via Microsoft Teams®
15.Presence of non-participants	No other presence aside from researcher and participants
16. Description of sample	Data on role of participants mentioned in report- hospital based ES's of PTPTs. Highlighted lack of other sectors.
Data collection	
17. Interview guide	Focus group script prepared in advanced and tested with research team, submitted as part of ethics proposal
18.Repeat interviews	No repeat interviews
19.Audio/visual recording	Recording audio and visual
20.Field notes	Some notes made for responses on vote at end of each calculation.
21.Duration	60 min set aside; sessions lasted around 30 min
22.Data saturation	Initial proposal for max 3 focus groups of 6 people to minimise risk of data saturation but gather enough information for the research.
23.Transcripts returned	Recordings and transcripts available for 28 days after focus group for all participants via Microsoft Teams® to allow for comments if required. Overall feedback not provided to individuals though.

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COREQ checklist criteria[16]	Team response
Domain 3: analysis and findings	
Data analysis	
24.Number of data coders	Main coding done by lead author, reviewed by co-author
25.Description of the coding tree	Coding tabulated in report
26.Derivation of themes	Themes coded through framework analysis. Initial deductive coding of themes undertaken and then developed further during the transcription and coding process.
27.Software	NViVo® software used
28.Participant checking	Recordings and transcripts available for 28 days after focus group for all participants via Microsoft Teams® to allow for comments if required. No comments provided
Reporting	
29.Quotations presented	Quotes presented and numbered in report
30.Data and findings consistent	Consistency provided with review from wider team
31.Clarity of major themes	Major themes presented and discussed (each calculations approach moving forwards)
32.Clarity of minor themes	Minor themes presented and discussed within the report (consideration of where to apply in curriculum).

References

1. Newby B. Expanding the role of pharmacy technicians to facilitate a proactive pharmacist practice. *Am J Health Syst Pharm*. 2019;76(6):398–402. https://doi.org/10.1093/ajhp/zxy065.
2. Boughen M, Fenn T. Practice, skill mix, and education: The evolving role of pharmacy technicians in Great Britain. *Pharmacy (Basel)*. 2020;8(2). https://doi.org/10.3390/pharmacy8020050.
3. Boughen M, Sutton J, Fenn T, Wright D. Defining the role of the pharmacy technician and identifying their future role in medicines optimisation. *Pharmacy (Basel)*. 2017;5(3). https://doi.org/10.3390/pharmacy5030040.
4. Koehler T, Velthuis F, Helmich E, Westerman M, Jaarsma D. Implementing the pharmacy technician role in existing pharmacy settings: stakeholders views of barriers and facilitators. *Res Soc Adm Pharm*. 2022;18(10):3814–3820. https://doi.org/10.1016/J.SAPHARM.2022.04.005.
5. Schafheutle EI, Jee SD, Willis SC. Fitness for purpose of pharmacy technician education and training: the case of Great Britain. *Res Social Adm Pharm*. 2017;13(1):88–97. https://doi.org/10.1016/j.sapharm.2015.12.011.
6. Health Education England. Advancing pharmacy education and training: a review advancing pharmacy education and training: a review 2. Accessed March 1, 2024 https://www.hee.nhs.uk/sites/default/files/documents/Advancing%20Pharmacy%20Education%20and%20Training%20Review.pdf; 2019.
7. GPhC. Standards for the initial education and training of pharmacy technicians. Accessed March 30, 2023 https://www.pharmacyregulation.org/initial-PT; 2017.
8. *Standards for the initial education and training of pharmacy technicians.* 2010.
9. Schafheutle EI, Jee SD, Willis SC. Fitness for purpose of pharmacy technician education and training: the case of Great Britain. *Res Soc Adm Pharm*. 2017;13(1):88–97. https://doi.org/10.1016/J.SAPHARM.2015.12.011.
10. General Pharmaceutical Council. Guidelines for registered pharmacies preparing unlicensed medicines. GPhC.
11. Grace EM. *ASHP-ACPE-pharmacy-technician-standard-BOD-Approved-2018-0713*. 2018.
12. NAPRA. Professional Competencies for Canadian Pharmacy Technicians at Entry to Practice. 2014. Accessed March 1, 2024 https://www.ashp.org/-/media/assets/professional-development/technician-program-accreditation/docs/ashp-acpe-pharmacy-technician-accreditation-standard-2018.ashx?la=en&hash=36EAA6511105A6C6BFEA4F30E193892F19E2C385; 2014.
13. Zahara-Such RM. Improving Medication Calculations of Nursing Students through Simulation: An Integrative Review. doi:https://doi.org/10.1016/j.ecns.2012.08.003.
14. Marks R, Hodgen J, Coben D, Bretscher N. Nursing Students' experiences of learning numeracy for professional practice. *Adults Learning Mathematics: An International Journal*. 2015;11(1):43–58.
15. Smith B, Kinsey H. It doesn't add up! Calculations in the modern pharmacy technician curriculum. *Int J Pharm Pract*. 2022;30(Supplement):ii50. https://doi.org/10.1093/IJPP/RIAC089.060.
16. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6):349–357. https://doi.org/10.1093/INTQHC/MZM042.
17. Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol*. 2013;13(1):1–8. https://doi.org/10.1186/1471-2288-13-117/METRICS.