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RESEARCH ARTICLE

# A mixed methods study of a competency-driven approach in a pharmacy course

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## Abstract

**Background:** There is a call to transition from traditional grades towards Competency-Based Education (CBE) for health professionals, however, evidence is needed to describe the challenges and opportunities unique to pharmacy education. Students' understanding and faculty perceptions of a CBE approach would help foster acceptance. **Objective**: to assess student opinions, understanding, and attitudes towards implementing a Competency-Driven (CD) approach into a pharmacy course. A secondary objective was to assess faculty perceptions of the CD approach. **Methods:** A CD approach was implemented in Foundations of Pharmacy Practice, a two-semester course. Using mixed methods, 61 students enrolled in the course participated in a pre-and post-survey and focus group. **Results:** Sixty-two per cent of students provided informed consent, and five participated in a focus group. Findings demonstrate that students believe individualised feedback fosters professional growth. Students consistently valued feedback on non-graded assessments and were less likely to agree that graded assignments assisted their learning/professional development. Over half of the students prioritised graded courses over pass-or-fail coursework. Five qualitative themes included professional growth, motivation, sufficient time frame, supportive environment, and career success. **Conclusion**: While students perceive that a CD approach creates a supportive learning environment and promotes professional development, most prioritised traditionally graded coursework.

## Introduction

Pharmacy practice is rapidly evolving, expanding the role of pharmacists and necessitating an educational model that promotes self-directed professional development. There is a disconnect between traditional educational models focused on high-stakes assessments at predetermined intervals and a healthcare environment, historically marked by quality and safety issues, which is shifting toward coordinated, team-based, patient-centred care. The existing educational model over-emphasises knowledge through tests and grades, neglecting the essential skills and attitudes required for effective contemporary clinical practice (Frank *et al*., 2010; Hanson *et al*., 2013). The familiar student request for additional points reflects a focus on point accumulation rather than on genuine learning and professional development.

Given these challenges, namely, the reliance on numerical grades, a focus on knowledge acquisition over competencies, a one-size-fits-all educational model, and a growing need for interprofessional collaboration, there is increasing support for a competency-based educational approach (Frank *et al*., 2010; Holmboe *et al*., 2017; Lucey, 2018; Cain *et al*., 2022; Rhoney *et al*., 2023). With a focus on preparing healthcare professionals to meet the needs of those served, the goal of competency-based education (CBE) is to improve outcomes for patients and learners (Burrows *et al*., 2013; Holmboe *et al*., 2017).

The American Association of Colleges of Pharmacy Competency-Based Education Task Force established the following definition: "*Competency-based pharmacy education is an outcomes-based curricular model of an organised framework of competencies (knowledge, skills, attitudes) for pharmacists to meet healthcare and*

*societal needs. This learner-centred curricular model aligns authentic teaching and learning strategies and assessment (emphasising workplace assessment and quality feedback) while de-emphasising time*" (Daugherty *et al*., 2024).

Despite its potential, there are concerns about the increased workload for educators in providing individualised feedback and the challenges of accommodating students progressing at different paces (Holmboe *et al*., 2017; Waterfield, 2017; Katoue & Schwinghammer, 2020; de Heer et al., 2024; Jarrett *et al*., 2024). Additionally, while traditional grades serve as extrinsic motivators, the effects of CBE on student pharmacists' effort and intrinsic motivation for lifelong learning are unclear (Cain *et al*., 2022). Thus, there is a need for evidence that describes the unique challenges and opportunities of integrating CBE into pharmacy education.

For this research, the term, competency-driven (CD) is used to describe our approach that included all of the components of competency-based pharmacy education except full curricular integration. The objective of this study was to provide insight into the opportunities and challenges of integrating a CD approach into an individual course to facilitate acceptance of CBE into the broader pharmacy curricula. To achieve this, the primary outcome of the study was to assess student pharmacist opinions, understanding, and attitudes toward implementing a CD approach in a two-semester course occurring in the first professional (P1) year entitled, Foundations of Pharmacy Practice. A secondary outcome was to assess faculty perceptions of the workload, strengths, and challenges of the CD approach within the course. This dual perspective from both students and faculty is crucial for forming a holistic understanding of the practical implications of adopting CBE in pharmacy education.

## Methods

### *Course description and alignment with CBE*

The Foundations of Pharmacy Practice course teaches students vital competencies in communication, collaboration, teamwork, health advocacy, and professionalism. These competencies were developed to ensure the education and training were structured to meet the needs of the pharmacy profession workplace in improving healthcare delivery, a necessary aspect of CBE. Additional elements of a CBE approach used in this course series included teaching and learning strategies aligned with the competencies, assessment of competency demonstration, and individualised feedback provided to students. Time-variable learning was achieved through multiple opportunities for students to demonstrate mastery of competency within the confines of the semester (de Heer *et al*., 2024). Rubrics were used as a framework for feedback and to clarify the knowledge, skills, and attitudes needed for successful competency demonstration.

A key course assessment was a year-long, team-based project in which students collaborated on a healthcare-related topic. Students submitted individual and team assignments throughout two semesters, including multiple drafts of a written paper and a team presentation. After learning how to provide meaningful feedback, they also engaged in peer and self-assessments throughout the project. Each assignment included specific feedback that guided subsequent drafts. By identifying their contributions to the team paper, students received individual and team instructor feedback. Course instructors collaborated to ensure consistent, objective (supported by examples), and timely feedback that was balanced, fair, and aligned with student expectations. Students repeated course activities until they demonstrated competency, guided by activity-specific rubrics and individualised feedback.

### *Competency development*

While several professional pharmacy organisations have defined overlapping competencies to align pharmacy education with societal healthcare needs, no standard currently exists (McRobbie *et al.*, 2001; Waterfield, 2017; Katoue & Schwinghammer, 2020; Engle *et al*., 2020). In the absence of a consensus, the investigators adopted four of the seven roles from the CanMEDS competency framework, originally designed for physicians, to identify the most relevant areas for P1 students in the context of this course: communicator, collaborator, health advocate, and professional (Frank, 2005; Westein *et al*., 2019; Katoue & Schwinghammer, 2020). The course faculty developed measurable competencies for each role, which were validated by input from pharmacists across various practice settings, including public health, academia, managed care, the pharmaceutical industry, ambulatory care, community practice, acute care, and telehealth. These competencies were then mapped to the course learning objectives, accreditation standards, CanMeds Roles and Competencies, and Centre for the Advancement of Pharmacy Education (CAPE) educational outcomes (Table I) (Frank, 2005; Medina *et al*., 2013). Rubrics (available upon request) were developed to define and assess mastery of these competencies.

**Table I: Competencies mapped to learning objectives and assessment**

| Student learning objectives | CanMeds roles and competencies | Evidence of learning | ACPE appendix I standards | CAPE educational outcomes |
|---|---|---|---|---|
| Actively participate and engage as a team member toward a common goal by demonstrating mutual respect, open communication, constructive feedback, and effective collaboration on a team project. | Collaborator: The P1 student collaborates with peers on their team efficiently. This includes effectively consulting and interacting with teammates, having respect for the opinions of others, ensuring appropriate distribution of workload, fostering accountability, contributing fair share, staying on track, demonstrating mutual respect, building consensus, being diplomatic, effectively working through team conflict, having a commitment to a high quality of work, and having appropriate knowledge and skills for project completion. | Team Projects, Peer evaluations, Personality assessments, Team presentation | Professional Communication, Professional Development | 2.3 Health and Wellness<br>3.1 Problem Solving<br>3.2 Educator<br>3.6 Cultural Sensitivity<br>4.1 Self-awareness<br>4.2 Leadership<br>4.3 Innovation<br>4.4 Professionalism |
| Practice behaviours and values of a professional student pharmacist. | Professional: The P1 student demonstrates professionalism through collaboration with their team, demonstrating reliability, punctuality, responsibility, and accountability, maintaining positive relationships with others, using feedback to make positive change, upholding principles of integrity and respect including in all communications, and projecting a professional appearance. | Team Project, Guided reflections, Group discussions, In-class participation, Oral final exam | Professional Communication, Professional Development | 4.4 Professionalism |
| Demonstrate effective verbal and written communication. | Communicator (general): The P1 student participates in discussions using appropriate verbal and non-verbal communication skills when interacting with others. This includes using appropriate terminology, body language, tone, eye contact, and speaking pace; Having no distracting mannerisms such as preoccupation with a phone or electronic device, inattentiveness, or side conversations; Being open to different opinions and perspectives, using a constructive tone; and showing enthusiasm, confidence and politeness.<br><br>Communicator (writing): The P1 student can effectively communicate in professional writing.<br><br>Communicator (verbal): P1 students communicate effectively when giving a presentation. This includes a lack of distracting mannerisms such as awkward transitions, verbal stumbles, rapid pace, filler words, excessive reliance on notes; Has appropriate dress, confidence, language, formality, and tone; Is knowledgeable and prepared with accurate content and ability to answer questions; Responds to audience questions in a professional manner. If a presentation aid/handout is used, it complements the presentation clearly and concisely, focusing on the most important points. | In-class team meetings, Team Project, Written paper, Class participation, Group presentation, Reflections, Oral final exam, Peer Evaluations | Professional Communication | 3.6 Communication |
| Describe professional advocacy and identify ways to advocate on behalf of the profession or patients. | The P1 student can evaluate a problem and advocate for ways to minimize/overcome challenges. This includes having an awareness of healthcare-related challenges, an openness to understanding patient challenges and perspectives of others and identifying opportunities to minimize/overcome challenges. | Small group discussion, Team presentations, Team letter to legislator | Professional Communication | 3.3. Patient Advocacy |

ACPE=Accreditation Council for Pharmacy Education, CAPE=Centre for the Advancement of Pharmacy Education, P1=first professional year

### *Design*

This mixed-method study included both a survey for quantitative analysis and a focus group for qualitative analysis. The study was approved by the university Institutional Review Board (Wilkes University IRB-525). Students in the two-semester Foundations of Pharmacy Practice course completed a pre-survey at the start of the Fall 2022 semester and a post-survey and focus group during the Spring 2023 semester. On the first day of class, after completing the pre-survey, students were introduced to the CBE model, during which faculty explained why the model was being used in the course and the proposed benefits on student professional development. The surveys were part of normal coursework; however, students were asked for consent to use their responses for research.

The survey was developed by the investigators and pilot-tested for relevance and clarity by a small group of faculty members and fourth-year student pharmacists. Students received an email invitation to the survey, which was completed electronically via Google Forms. An informed consent statement was attached to each survey, and students who did not consent were excluded. Likert-type scale questions were used, mean composite scores were calculated by category, and paired samples *t*-tests were applied for comparisons. Student demographics (gender, years of pre-pharmacy education, experience with competency-based assessments) were collected and analysed with descriptive statistics. The course faculty remained unaware of students' consent status as student names were coded and de-identified by an independent blinded investigator before being shared with the instructors. Statistical analysis was performed using SPSS version 29.0 (IBM, Armonk, NY).

At the end of the post-survey, students could opt into a focus group via a separate registration link, with instructors not privy to participants' identities. To encourage participation, students were entered into a drawing for a $10 Starbucks gift card. The focus group, led by a faculty member not involved in the course, employed a semi-structured interview conducted over Zoom, which was recorded and transcribed. Questions (Appendix A) examined participants' views on the impact of a CD approach on intrinsic motivation to learn, professional development, and career success. No identifying information was collected, and all transcriptions were de-identified. After de-identification, the focus group transcript was analysed using a codebook, with coding discrepancies resolved through discussion. Coded data was analysed using inductive thematic analysis. Course coordinators also maintained an unstructured reflective journal throughout the course to document observations regarding workload, strengths, and challenges of the CD approach.

### *Ethics approval*

The Wilkes University IRB determined that this research, identified as IRB 525, is exempt. Participants gave informed consent to use their data in the study.

## Results

### *Quantitative analysis*

Of the 61 students enrolled in the two-semester course, 38 (62%) provided informed consent. Of those, most (90%) were traditional college age (up to age 22 years), with the remaining ages ranging between 25-33 years. Over half (63%) identified as female. Most (76%) had completed two years of pre-pharmacy education, 10% had completed three years, and the rest did not specify. Eighty per cent of students reported having some experience with a pass-or-fail course. All students demonstrated mastery of all competencies after the first or second attempt of course assessments and passed the course.

Survey results are presented in Table II. Following exposure to a CD approach, students were less likely to agree that graded assignments were important to them (4.55 pre-survey *vs* 4.24 post-survey, $p = 0.044$) or effective for their learning and professional development (4.37 *vs* 3.87, $p = 0.004$). Perceptions trended toward less agreement that graded assignments prepare them for Advanced Pharmacy Practice Experience (APPE) or future practice (3.92 *vs* 3.53, $p = 0.05$). Additionally, students were less likely to agree that they understood the impact of graded assessments on their professional growth (4.53 *vs* 4.34, $p = 0.03$). There were no significant differences regarding the importance of non-graded assessments with feedback or their impact on individual performance or overall professional growth.

**Table II: Survey results**

| Survey questions | Pre (mean) N=38 | Post (mean) N=38 | *p* value |
|---|---|---|---|
| **Graded assignments (or grades) …** | | | |
| are important to me | 4.55 | 4.24 | 0.044 |
| assist with my learning / professional development | 4.37 | 3.87 | 0.004 |
| are an effective way to assess my knowledge of a topic | 4.03 | 3.87 | 0.4 |
| are an effective way to assess my level of skill | 3.95 | 3.74 | 0.2 |
| help me understand my performance | 4.34 | 4.16 | 0.2 |
| help prepare me for APPEs / future practice | 3.92 | 3.53 | 0.05 |
| **I understand the impact of graded assessments on my professional growth** | 4.53 | 4.34 | 0.03 |
| **Non-graded assessments with feedback…** | | | |
| are important to me | 4.03 | 3.89 | 0.4 |
| assist with my learning / professional development | 4.29 | 4.18 | 0.4 |
| are an effective way to assess my knowledge of a topic | 4.05 | 4.03 | 0.9 |
| are an effective way to assess my level of skill | 4.03 | 4.00 | 0.9 |
| help me understand my performance | 4.26 | 4.11 | 0.4 |
| help prepare me for APPEs / future practice | 4.32 | 4.18 | 0.4 |
| **I understand the impact of non-graded assessments on my professional growth.** | 4.37 | 4.37 | 1 |
| **I am motivated to do my best work when …** | | | |
| the assignment counts towards a grade | 4.63 | 4.37 | 0.048 |
| I receive detailed individual feedback | 4.68 | 4.24 | < 0.001 |
| I receive detailed group feedback | 4.29 | 3.71 | 0.001 |
| I know it will contribute to my professional growth | 4.76 | 4.61 | 0.1 |
| **I prefer receiving a numerical grade over a non-graded assignment with feedback.** | 3.47 | 3.42 | 0.8 |
| **I prefer getting a grade for a course instead of a pass-or-fail designation.** | 3.45 | 3.42 | 0.9 |
| **In a curriculum with graded and pass-or-fail coursework, I exert my effort equally to both graded and pass-or-fail courses** | 24 (63%) | 17 (45%) | |
| **In a curriculum with graded and pass-or-fail coursework, I put most of my effort into graded courses** | 12 (32%) | 20 (53%) | |
| **In a curriculum with graded and pass-or-fail coursework, I put most of my effort into pass-or-fail courses** | 2 (5%) | 1 (2.6%) | |

APPE=Advanced pharmacy practice experience

Comparing pre- and post-survey results, students were less likely to agree that they are motivated to do their best when assignments count towards a grade (4.63 *vs* 4.37, $p = 0.048$). Conversely, they also became less motivated by detailed individual feedback (4.68 *vs* 4.24, $p < 0.001$) and group feedback (4.29 *vs* 3.71, $p = 0.001$). Professional growth remained a key motivator in both surveys (4.76 and 4.61, $p = 0.1$). Student preference for numerically graded versus non-graded assignments remained neutral, with no difference between the pre- and post-surveys (3.47 and 3.42, $p = 0.8$).

Similarly, preferences for a traditional letter grade versus a pass-or-fail designation were also neutral (3.45 and 3.42, $p = 0.9$). Notably, while 63% of students indicated they exerted equal effort in both graded and pass-or-fail courses in the pre-survey, this dropped to 45% in the post-survey. Over half (53%) of students prioritised graded courses, with fewer than 5% prioritising pass-or-fail coursework.

### *Qualitative analysis*

Six students agreed to participate in the focus group, but only five attended due to a communication lapse. Five key themes emerged, focusing on professional growth, motivation, time allocation, supportive environment, and career success (Table III). In the first theme, students felt that individualised feedback,

rather than numerical grades, better promoted their professional growth, particularly regarding affective skills such as communication, listening, critical thinking, and professionalism. They believed this feedback helped them identify areas for improvement that are broadly applicable in pharmacy practice.

**Table III: Themes and representative quotes**

| Summary theme | Representative quotes |
|---|---|
| Compared to numerical grades, individualised feedback promotes student professional growth/development. | *"You can't assign a grade to those skills. You can't say…you have a 70% on your communication skills"*<br>*"If you don't do well in an assignment instead of just getting a terrible grade at the top of the paper, you get a thoughtful written out reasoning of how you can improve."*<br>*"It feels a bit more like we have a bit more responsibility, and maybe we're being held at a higher level."*<br>*"If this was a graded course, we may take a different approach with the assignments, as we do with other graded classes, in terms of just wanting to get it done and submitted, and not getting feedback and improving on it."* |
| A competency-based education approach shifts the motivation from an extrinsic focus (e.g., competition, getting an A) to an intrinsic motivation (e.g., self-improvement) | *"It's more working on yourself than comparing yourself to others."*<br>*"I used to put the bare minimum effort into things which reflected the quality of my work. So it wasn't the best at first, but as I got feedback, it really elevated the quality of my work."*<br>*"You're not worried about failing or getting a worse grade than each other or whatever. And you're not trying to, like, be the best. You're really just trying to improve on yourself."* |
| Compared to a graded course, CBE provides time for improvement, leading to confidence-building | *"There's a lot more room for check-ins in the competency-based courses because we're not rushed for time."*<br>*"This class is really just like a confidence booster."*<br>*"And you can really just keep improving on yourself instead of moving on if you don't know how to do it because we are going to need all of these skills in our future."* |
| CBE creates a supportive environment. | *"The professors trying to help you improve for your future. And they're not just gonna, like, let you fail or anything. They're gonna work with you to help you improve."*<br>*"They want us to improve, and they…treat us like colleagues rather than students… It's kinda okay not to have a letter grade. Because why would you want to rate your colleague?"* |
| Mastery of the course competencies is important for student professional success, especially in a competitive job market. | *"So, I think it just kind of gets us ready for our career path more."*<br>*"The motivator is that basically, this class is teaching us what's gonna help us get the job."*<br>*"These skills that we're getting our competencies in are gonna be really what makes us stand out as a candidate, or, you know, really help us get the job that we want."*<br>*"When you're in this profession, you're going to need all these skills, and that's why they are pushing that we do, maybe be a bit more… they want us to write in a more professional tone and like that's important. So, when we have to send something to a doctor, and we write in a professional tone, so we're not undermined, and I think a lot of the feedback they're giving is because they know we'll need it in the future."* |

In the second theme, motivation shifted from extrinsic factors like achieving high grades and peer competition to intrinsic factors such as self-improvement and skill development. The third theme highlighted students' appreciation for the time allowed for skill enhancement compared to the "*rushed*" nature of traditional courses. In theme four, students expressed that they experienced a supportive environment focused on their professional development, receiving meaningful guidance from faculty. Finally, the fifth theme underscored the importance of competency mastery for professional success, particularly in a competitive job market.

A recurring observation from instructor journals was that minimal additional effort was required once the course was underway. The faculty noted that providing feedback without the pressure of assigning grades made the process more meaningful and less stressful, even if it required additional time. The CD approach allowed the faculty to concentrate on students who needed more guidance. The faculty also noted no perceived reduction in student effort compared to previous years when traditional grading was used.

## Discussion

The quantitative and qualitative analyses show that students view individualised feedback as essential for their professional growth and development. Qualitative themes reveal that specific and

personalised feedback helps students identify areas of improvement and motivates their ongoing development. Affective skills like communication, listening, critical thinking, and professionalism are difficult to assess solely through numerical grades; targeted feedback provides the necessary guidance to enhance these crucial skills.

There were no significant differences in quantitative pre- and post-survey data on the students' perceptions of the importance of non-graded assessments with feedback or the impact of non-graded assessments on individual performance, preparation for APPEs, or overall professional growth. These results show that students initially valued the individualised feedback guiding course competencies, and their perceptions did not change over time. These findings are encouraging and align with the qualitative data and existing literature that highlights the value placed by professional-level students on constructive feedback and its impact on professional development (Poulos & Mahony, 2008; Marie, 2016; Glazzard & Stones, 2019).

Through this CD approach, student motivation shifted from extrinsic factors, such as grades and competition, to intrinsic factors focused on professional development. However, further study is needed to understand why detailed individual or group feedback became less effective in motivating students to excel despite this shift, as this may disincentivise faculty efforts to provide such feedback. The qualitative data indicates that students value assignments and subsequent assessments that contribute to their professional growth regardless of feedback or grades. Notably, the decline in agreement with group feedback as a motivator (from 4.29 to 3.71, $p = 0.001$) warrants exploration, as it may stem from how feedback is delivered or the inherently less personalised nature of group feedback. Indeed, previous research suggests that perceptions of group work are influenced by group dynamics, grading, and faculty communication (Payne *et al*., 2006).

A notable observation is the transformation in students' assessment approach, shifting from a competitive mindset to one centred on self-improvement. This shift underscores the dual purposes of assessments: to demonstrate competence and to rank students for competitive job markets. By eliminating grades and the accompanying ranking system, the study highlights the benefits of prioritising assessment as a tool for learning rather than competition.

In terms of grading, student preference for graded courses/assignments versus non-graded or pass-or-fail courses/assignments was neutral (range 3.42-3.47) and did not shift during the study. This finding needs further exploration to better understand student grading preferences. Students are not typically included in decisions regarding grading schemas for courses, so this question could be difficult to contextualise.

In a curriculum that includes traditionally graded coursework and a CD approach, students will likely prioritise courses that impact their grade-point average (GPA), as pass-or-fail courses do not count toward it. Throughout the semester, over half (53%) of students prioritised graded courses over their work in pass-or-fail courses. Several factors contribute to this trend. In the focus group, some students expressed a desire to secure residency placements or better job opportunities, which they believe are influenced by their GPA. This perception of GPA as a critical factor for earning a residency leads students to prioritise graded courses (Wang *et al*., 2023). Additionally, most pharmacy schools maintain GPA threshold requirements for good standing. First-year pharmacy students are also most accustomed to traditional grading systems from their undergraduate education, prompting them to focus on courses they perceive will help them advance successfully in the program.

While the study data suggests that a few students will prioritise the CD approach over numerically graded coursework, it does not necessarily reflect where they perceive value. Students may be demonstrating pragmatism in triaging the work that has firm deadlines, in comparison to a CD approach that gives students multiple opportunities to practice skills to demonstrate competency (Ryan & Deci, 2000; Cain *et al*., 2022). Similarly, students will likely prioritise short modules over 16-week courses since the opportunities for demonstrating knowledge are more compressed. Additionally, Foundations of Pharmacy Practice is a two-credit course, and students may prioritise higher credit-loaded courses. Future studies could ask students to track the time spent on different courses to compare to their perceived effort.

***Alignment with CBE***

Several key elements of CBE emerged from the focus group. Students reported a shift from extrinsic to intrinsic motivation, reinforcing that CBE empowers students to take responsibility for their learning and fosters habits of lifelong learning (Katoue & Schwinghammer, 2020). They viewed assessments and subsequent detailed, individualised feedback as valuable opportunities to enhance their skills and be relevant to future professional success. This suggests that the course assessments were authentic and aligned with contemporary practice, equipping students with essential skills for a competitive workforce. The CD approach encouraged a growth

mindset, where feedback facilitated continuous self-reflection and improvement. Students additionally described a learner-centred supportive environment, with ample time and individualized faculty guidance contributing to their professional development. This aligns with a core principle of CBE, which de-emphasizes time constraints, allowing students multiple opportunities to practice and demonstrate mastery at their own pace (Daugherty *et al*., 2024).

***Instructor perceptions***

The course instructor's perceptions supported previous findings that assigning grades disrupts learning and distracts students and the faculty (Cain *et al*., 2022). In previous years of this course, students were fixated on their grades, overlooking formative feedback. However, with a CD approach, they became more receptive to written feedback, demonstrated fewer frustrations, and asked more insightful questions to clarify the feedback. Allowing students to revise and resubmit assignments required minimal effort from faculty while ensuring competency demonstration. This approach also diminished the stigma associated with a low or failing grade (Lipnevich & Smith, 2009; Cain *et al*., 2022), particularly benefiting students falling just below the minimum expectations by giving them a chance to master the material through additional practice.

Furthermore, it was successfully applied to team projects, where extra drafts allowed teams to refine their skills without the negative implications of lower grades compared to other teams. Importantly, a CD approach enabled faculty to focus on students needing more guidance, fostering stronger connections and supporting their professional development. Notably, there was no perceived decline in student effort; as noted, efforts increased when students needed to repeat assessments. Overall, the faculty found the CD approach effective for nurturing professional development, ensuring competency mastery, and building trust with students.

Concerns about the time required for providing descriptive feedback in a CBE approach have been noted (Holmboe *et al*., 2017; Waterfield, 2017; Katoue & Schwinghammer, 2020; de Heer *et al*., 2024; Jarrett *et al*., 2024). While course instructors acknowledge that individualised and meaningful feedback takes time, strategies exist to enhance efficiency. Team teaching can help divide the workload, and creating a list of common feedback for student writing allows instructors to proactively address frequent errors. This approach serves as a discussion tool with students and as a template for providing consistent feedback.

***Limitations***

The study has several limitations that may affect the generalizability and reliability of the findings. The small sample size, drawn from a single institution and limited to one focus group of only five participants, restricts the diversity of perspectives and may skew the results. Additionally, only 62% of students provided informed consent, raising concerns about representation and participation bias. The study included only P1 students in a course that traditionally focused on developing affective skills, restricting the generalizability of the findings to other courses and professional years. The use of mean composite scores from a Likert-type scale and paired samples t-tests could be a limitation for data that is not normally distributed. However, *t*-tests are generally sensitive to violations of normality.

Furthermore, a lack of a shared set of validated competencies in pharmacy education presents another limitation (McRobbie *et al*., 2001; Engle *et al*., 2020; Katoue & Schwinghammer, 2020). While the investigators refined the competencies with stakeholder input to enhance validity and relevance, other than the rubric for assessing professionalism (Kelley *et al*., 2011), the rubrics used in this course were not validated. These limitations underscore the need for future research to involve larger and more diverse samples from multiple institutions, include students across various professional years, and establish standardised competencies with validated assessment tools.

## Conclusion

By adopting a CD approach, the investigators aim to advance toward competency-based pharmacy education. Our experience reinforces that a CD approach fosters a supportive learning environment, nurtures faculty-student partnerships, and can enhance student professional development. These elements are essential for success in pharmacy education and training and for adapting to evolving scopes of practice that drive improved health outcomes. Our results also highlight the importance of a curricular approach to CBE. While emphasising mastery of competencies over grades, when a CD approach is combined with traditionally graded courses, students are likely to prioritise graded coursework, driven by a perception that GPA is crucial in securing post-graduate employment.

Further studies are needed to investigate the impact of detailed individual and group feedback on student motivation to ensure that faculty efforts effectively

promote student professional development. Ongoing research is essential to refine the CBE approach and navigate the complexities of its implementation. The foundation of a CBE approach begins in pharmacy school, extending throughout a professional career, ensuring that student pharmacists are self-directed and prepared to engage in and lead an evolving scope of practice.

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## Conflict of interest

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## References

Burrows, J., Kirkpatrick, C., Coombes, I., Cardiff L., & Lum, E. (2013). The impact on clinical practice of a Postgraduate Clinical Pharmacy Programme, incorporating competency-based performance evaluation. *Pharmacy Education*, **13**(1), 177–182. https://pharmacyeducation.fip.org/pharmacyeducation/article/view/210

Cain, J., Medina, M., Romanelli, F., & Persky, A. (2022). Deficiencies of traditional grading systems and recommendations for the future. *American Journal of Pharmaceutical Education*, **86**(7), 8850. http://doi.org/10.5688/ajpe8850

Daugherty, K., Chen, A., Churchwell, M., Jarrett, J. B., Kleppinger, E.L., Meyer, S., Nawarskas, J., Sibicky, S. L., Stowe, C. D., & Rhoney, D. H. (2024). Competency-based pharmacy education definition: What components need to be defined to implement it? *American Journal of Pharmaceutical Education*, **88**(1), 100624. http://doi.org/10.1016/j.ajpe.2023.100624

de Heer, M. H., Driessen, E. W., Teunissen, P. W., & Scheele, F. (2024). Lessons learned spanning 17 years of experience with three consecutive nationwide competency-based medical education training plans. *Frontiers in Medicine*, **11**, 1339857. https://doi.org/10.3389/fmed.2024.1339857

Engle, J. P., Burke, J. M., Ashjian, E. J., Avery, L., Borchert, J. S., Faro, S. J. E., Harris, C. S., Herink, M. C., Jain, B., MacLaughlin, E. J., Martello, J. L., Moore, K., Rogers, E., Smith, W. J., & Stranges, P. M. (2020). ACCP clinical pharmacist competencies: Advocating alignment between student, resident, and practitioner competencies. *The Journal of the American College of Clinical Pharmacy*, **3**, 123–132. https://doi.org/10.1002/jac5.1200

Frank, J. (2005). The CanMEDS 2005 physician competency framework. Better standards. Better physicians. Better care. Ottawa: The Royal College of Physicians and Surgeons of Canada. https://www.ciperj.org/imagens/canmed2005.pdf

Frank, J. R., Snell, L. S., Ten Cate, O., Holmboe, E. S., Carraccio, C., Swing, S. R., Harris, P., Glasgow, N. J., Campbell, C., Dath, D., Harden, R. M., Iobst, W., Long, D. M., Mungroo, R., Richardson, D. L., Sherbino, J., Silver, I., Taber, S., Talbot, M., & Harris, K. A. (2010). Competency-based medical education: Theory to practice. *Medical Teacher*, **32**(8), 638–645. https://doi.org/10.3109/0142159X.2010.501190

Glazzard, J., & Stones, S. (2019). Student perceptions of feedback in higher education. *International Journal of Learning, Teaching and Educational Research*, **18**(11), 38–52. https://doi.org/10.26803/ijlter.18.11.3

Hanson, J. L., Rosenberg, A. A., & Lane, J. L. (2013). Narrative descriptions should replace grades and numerical ratings for clinical performance in medical education in the United States. *Frontiers in Psychology*, **4**, 668. https://doi.org/10.3389/fpsyg.2013.00668

Holmboe, E., Sherbino, J., Englander, R., Snell, L., & Frank, J. (2017). A call to action: The controversy of and rationale for competency-based medical education. *Medical Teacher*, **39**(6), 574-581. https://doi.org/10.1080/0142159X.2017.1315067

Jarrett, J. B., Elmes, A. T., Keller, E., Stowe, C. D., & Daugherty, K. K. (2024). Evaluating the strengths and barriers of competency-based education in the health professions. *American Journal of Pharmaceutical Education*, **88**(6), 100709. http://doi.org/10.1016/j.ajpe.2024.100709

Katoue, M. G., & Schwinghammer, T. L. (2020). Competency-based education in pharmacy: A review of its development, applications, and challenges. *Journal of Evaluation in Clinical Practice*, **26**, 1114-1123. https://doi.org/10.1111/jep.13362

Kelley, K. A., Stanke, L. D., Rabi, S. M., Kuba, S. E., & Janke, K. K. (2011). Cross-validation of an instrument for measuring professionalism behaviours. *American Journal of Pharmaceutical Education*, **75**(9), 179. http://doi.org/10.5688/ajpe759179

Lipnevich, A. A., & Smith, J. K. (2009). Effects of differential feedback on students' examination performance. *Journal of Experimental Psychology: Applied*, **15**(4), 319–333. https://doi.org/10.1037/a0017841

Lucey, C. (2018). Achieving competency-based, time-variable health professions education. Proceedings of a conference sponsored by Josiah Macy Jr. Foundation in June

2017. New York, Josiah Macy Jr. Foundation. https://macyfoundation.org/assets/reports/publications/macy_monograph_2017_final.pdf

Marie, J. (2016). Student views on the value of feedback. *Journal of Education and Training Studies*, **4**(6), 207–213. https://files.eric.ed.gov/fulltext/EJ1100358.pdf

McRobbie, D., Webb, D. G., Bates, I., Wright, J., & Davies, J. G. (2001). Assessment of clinical competence: Designing a competence grid for junior pharmacists. *Pharmacy Education*, **1**(2), 67–76. https://pharmacyeducation.fip.org/pharmacyeducation/article/view/10

Medina, M., Plaza, C., Stowe, C., Robinson, E. T., DeLander, G., Beck, D. E., Melchert, R. B., Supernaw, R. B., Roche, V. F., Gleason, B.L., Strong, M. N., Bain, A., Meyer, G. E., Dong, B. J., Rochon, J., & Johnston, P. (2013). Centre for the advancement of pharmacy education 2013 educational outcomes. *American Journal of Pharmaceutical Education*, **77**(8), 162. http://doi.org/10.5688/ajpe778162

Payne, B., Monk-Turner, E., Smith, D., & Sumter, M. (2006). Improving group work: Voices of students. *Sociology & Criminal Justice Faculty Publications.* https://digitalcommons.odu.edu/sociology_criminaljustice_fac_pubs/22

Poulos, A., & Mahony, M. (2008). Effectiveness of feedback: The students' perspective. *Assessment & Evaluation in Higher Education*, **33**(2), 143–154. https://doi.org/10.1080/02602930601127869

Rhoney, D. H., Chen, A. M., Churchwell, M. D., Daugherty, K. K., Jarrett, J. B., Kleppinger, E. L., Nawarskas, J. J., Sibicky, S. L., Stowe, C. D., & Meyer, S. M. (2023). Recommendations and next steps for competency-based pharmacy education. *American Journal of Pharmaceutical Education*, **87**(10), 100549. http://doi.org/10.1016/j.ajpe.2023.100549

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, **25**(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Wang, A., Karunungan, K. L., Story, J. D., Shlobin, N. A., Woo, J., Ha, E. L., Hauer, K. E., & Braddock, C. H. (2023). Reimagining a pass-or-fail clinical core clerkship: A US residency program director survey and meta-analysis. *BMC Medical Education*, **23**, 788. https://doi.org/10.1186/s12909-023-04770-8

Waterfield, J. (2017). How is the term 'competence' defined by the pharmacy educator? A qualitative study of science-based and practice-based pharmacy educators. *Pharmacy Education*, **17**(1), 350–356. https://pharmacyeducation.fip.org/pharmacyeducation/article/view/495

Westein, M., de Vries, H., Floor, A., Koster, A., & Buurma, H. (2019). Development of a postgraduate community pharmacist specialization program using CanMEDS competencies and entrustable professional activities. *American Journal of Pharmaceutical Education*, **83**(6), 6863. http://doi.org/10.5688/ajpe6863

**Appendix A: Focus group questions**

1. Describe the experience of receiving written feedback. Is the feedback meaningful to you?
2. How does the feedback you receive impact your professional growth?
3. How does it feel to not receive a number grade for assignments and the overall course grade for this 2-semester course?
4. What is the impact of knowing you need to achieve all of the competencies before you get credit for the course compared to receiving a grade?
5. What are some factors that motivate you to do your best with your coursework?
6. Discuss the amount of effort you put into the assignments that receive a numerical grade compared to those that don't receive a numerical grade.
7. Discuss the quality of your work on assignments that receive a numerical grade compared to those that don't receive a numerical grade.
8. What is the impact of competency-based grading on your competitiveness for future post-graduate experiences (e.g. employment, residencies, fellowships)?