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The Impact of Experiential Learning on Pharmacy Students' Perceptions of Professionalism: A Taiwanese Study

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Abstract

One of the most effective methods for promoting and developing professionalism is through hands-on, practice-based experiences. Yet, there is a lack of research in Taiwan examining how experiential learning programs influence pharmacy students' perspectives on professionalism, which is crucial for high-quality healthcare delivery. This research aimed to assess changes in the perceptions and attitudes of third-year pharmacy students toward professionalism after participating in an introductory-intermediate experiential learning course. A pre- and post-course comparative study was carried out in 2017, utilizing a self-administered survey. The participants were third-year students enrolled in a six-year pharmacy program. A 28-item questionnaire, rated on a 10-point Likert scale, was used to gauge the students' professionalism. Of the 28 items, 10 focused on the perceived significance of professionalism in pharmacy practice, while 18 items, adapted from the Pharmacy Professionalism Instrument, examined the students' attitudes toward pharmacy professionalism. The differences in the survey responses before and after the course were analyzed using an independent t-test, with a significance level set at 0.05.The study involved 52 pharmacy students, who exhibited notable improvements in three key areas of professionalism after completing the 5-week experiential course: altruism ($p = 0.035$), accountability ($p = 0.026$), and duty ($p = 0.002$).The results suggest that pharmacy students' attitudes toward professionalism can be significantly altered through a structured experiential learning program within the community pharmacy context. Such programs are effective in fostering positive attitudes in students regarding altruism, accountability, and duty, all of which are fundamental elements of professionalism in healthcare.

Keywords: Professionalism, Pharmacy, Experiential, Community

Introduction

The evolving landscape of pharmacy practices and technological advancements has transformed the role of pharmacists in patient care worldwide. Rather than remaining behind the counter, pharmacists now engage directly with patients, a shift that demands higher levels of professionalism, as well as specialized knowledge and skills [1]. Professionals who embody strong values of professionalism tend to deliver superior patient care and foster effective therapeutic relationships, which ultimately enhances public trust and improves perceptions of the healthcare profession [2]. Over the past few decades, pharmacists have transitioned from a role focused primarily on medication dispensing to one centered on providing direct, patient-oriented care in many countries [3]. To meet these broader responsibilities, pharmacy students must not only acquire knowledge but also cultivate professionalism throughout their education [4].

Professionalism is the active demonstration of the values central to a profession, encompassing both attitudes and behaviors expected of its members [5]. Although professionalism is a critical competency in the pharmacy profession and a key focus of pharmacy education, its

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teaching is often sidelined due to competing academic priorities and time constraints [6]. For instance, in Taiwan, pharmacy programs predominantly emphasize technical knowledge, such as science and clinical subjects, with little time allocated for developing professionalism during students' transition from novices to future practitioners. The incorporation of professionalism into the curriculum and its development in students has long been overlooked, partly due to inconsistent definitions and the lack of tools for evaluating it [7].

Pharmacists with strong professionalism are better able to provide high-quality pharmaceutical care. A key method for instilling professionalism in pharmacy students is through role modeling—where students observe and emulate professional behaviors [4, 8]. Professionalism development goes beyond formal coursework in pharmacy schools [9]; it must be cultivated through experiences in professional environments [5]. Schafheutle et al. argue that professionalism is best nurtured through activities related to the profession, such as dispensing medications, solving problems, and role-playing scenarios [10]. Additionally, students' professional growth is positively influenced by interactions with educators who actively engage in patient-facing roles within community pharmacies [2]. Situated Learning Theory (SLT) supports the notion that learning is embedded in authentic tasks and contexts [11]. Pharmacy students, in line with SLT, can enhance their professionalism by interacting with patients and collaborating with healthcare teams in community pharmacy environments. Novices can cultivate professionalism by reflecting on real-world tasks, such as medication counseling, that community pharmacists perform regularly [12]. Knowledge is most effectively learned when presented in real, practice-based contexts [13]. In the United States, for example, experiential learning is integrated into pharmacy curricula early to immerse students in real-world practices [14, 15]. Studies have shown that pharmacy students who engage in hands-on experiential training feel more confident and develop a more positive attitude toward professionalism [15]. However, there is a lack of similar research in Taiwan, despite the country's long-standing use of experiential learning in its pharmacy curriculum. This highlights the need for a comprehensive evaluation of the effectiveness of Taiwan's curriculum in fostering professionalism.

Experiential learning is a vital tool for strengthening professionalism. As students participate in experiential training, it becomes essential to assess how their professionalism develops [16]. At the School of Pharmacy, National Taiwan University, the Community Pharmacy Practice Experiences (CPPE) course has been a required component of the six-year PharmD program for almost thirty years [8]. Despite its long-standing presence in the curriculum, no systematic evaluation of its impact on students' professionalism has been conducted. Research underscores the importance of assessing professionalism to better understand students' identity development and to inform the teaching, learning, and assessment processes related to professional behaviors [17]. Collecting measurable data on professionalism can help shape future curricula and provide valuable insights for career counseling and advising [18].

The evaluation of professionalism is further complicated by its cultural and healthcare contextual variations [19]. While studies from other countries have explored the development of professionalism in pharmacy students [5, 7, 14], research on pharmacy professionalism in Taiwan remains limited [20]. In Taiwan, pharmacists are responsible for all aspects of prescription dispensing, including repetitive tasks like pill counting, which cannot be delegated to pharmacy technicians. However, tasks like medication therapy management are not routinely carried out in Taiwan's pharmacy practice. As a result, pharmacy students may develop a different understanding and approach to professionalism than what is observed in other countries [21]. This study, therefore, aims to assess how an introductory-intermediate experiential learning program influences third-year pharmacy students' perceptions of the professional attitudes necessary for effective pharmacy practice in community settings. By examining changes in students' views on professionalism before and after the course, this study seeks to provide valuable insights that will help educators refine curriculum design and better prepare students for the evolving role of pharmacists in contemporary healthcare.

Materials and Methods

The study adopted a pre- and post-course design with a self-reported survey to evaluate how the introductory-intermediate CPPE program influenced the development of professionalism in pharmacy students. Oral consent

was sought from all eligible participants before they enrolled. Participants were provided with full information about the study and reassured that their responses would remain anonymous. Data was securely stored with encryption and password protection, in line with institutional data security standards. Since the study's purpose was to assess the course, written consent was not required. Approval was granted by the Research Ethics Committee.

Course overview

National Taiwan University's School of Pharmacy introduced its first six-year Doctor of Pharmacy (PharmD) program in 2009, alongside the four-year BPharm program (1953–2017). The CPPE is a 5-week experiential learning course where students initially observe (introductory level) and later practice (intermediate level) fundamental pharmacy services. The course is worth 2 credits and comprises 180 hours of learning **(Figure. 1)** [8, 22]. Third-year students in the PharmD program (prior to 2017, these students were in their third year; after restructuring, they are now in their fourth year) are required to participate in this course during the summer prior to starting their fourth year (or fifth year, after the curriculum restructure). For most, this rotation serves as their first real-world experience in community pharmacy, though a few may have had prior work-study involvement. At the time of the study, none of the participants had completed introductory hospital rotations or advanced pharmacy practice experiences, which are undertaken in the later years of their education (fifth and sixth years).

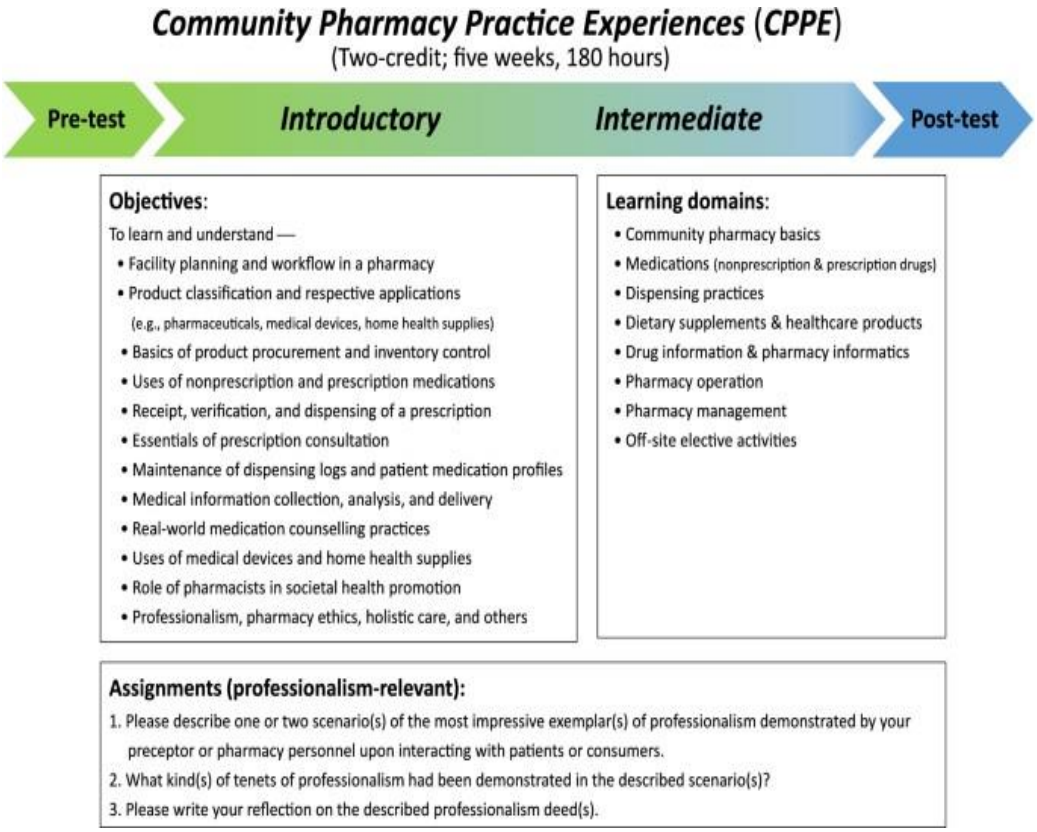


Figure. 1. The goals, learning domains, and assignments related to professionalism in the CPPE program [8, 22]

All preceptors involved in the CPPE program participate voluntarily and are required to hold at least a Bachelor's degree in Pharmacy. Additionally, they undergo a 16-hour training session focused on developing their teaching abilities and reinforcing key aspects of the CPPE program, ultimately enhancing their capacity to model professionalism for students [8, 23]. These preceptors are expected to serve as role models for students, offering real-world examples of professionalism during the experiential learning process. The CPPE utilizes four core strategies to deepen students' understanding and application of professional

knowledge: (1) mentorship through the pharmacist-student relationship, (2) immersive learning within a real community pharmacy setting, (3) exposure to authentic patient interactions and pharmacy tasks, and (4) opportunities for interdisciplinary learning [8, 20]. As depicted in **Figure 1**, the course aims to foster professionalism by integrating these approaches into the program's structure. Students first shadow pharmacists during the early weeks (Introductory CPPE) to observe the day-to-day operations, such as understanding the work environment, the medication dispensing procedure, and patient consultations. In the later stages of the course (Intermediate CPPE), students begin taking on active roles, such as processing prescriptions, answering patient questions, and engaging in public health initiatives alongside their peers and healthcare team members. This structured learning process provides students with hands-on opportunities to interact with both mentors and patients, helping them develop the professional attitudes and behaviors expected of pharmacists.

Setting and participants

The study was conducted in 2017, with third-year pharmacy students participating in the program across 20 community pharmacies located in four densely populated urban areas in Taiwan. These included seven pharmacies in Taipei, eleven in New Taipei City, one in Taichung, and one in Kaohsiung. The participants, who were third-year pharmacy students, had prior knowledge in pre-pharmacy studies as well as biomedical and pharmaceutical sciences. A power analysis was conducted using G*Power 3.1 to determine the sample size needed for sufficient statistical power. Based on an assumed effect size ($d = 0.80$) and significance level ($\alpha = 0.05$, two-tailed) [24], the analysis indicated that 52 participants would provide adequate power for the study (0.80) [24, 25].

Instruments

A 28-item instrument was constructed to evaluate pharmacy students' professionalism, drawing from prior research in the field of pharmacy education and adapted to reflect regional healthcare norms [4, 20, 26-30]. This tool covered ten core principles deemed essential for fully representing professionalism among pharmacy students: altruism, accountability, excellence, communication, honour and integrity, respect for others, duty, ethics, humanism, and teamwork. Content validity was established by having experts in pharmacy education and clinical practice review an early draft. They scored each item's relevance on a 5-point Likert scale (1 = not fit at all, 5 = perfectly fit) and supplied qualitative feedback on the overall design. Additionally, a consensus meeting was organised to discuss the experts' evaluations and refine the items accordingly. Following incorporation of their feedback, the scale's content validity was quantified using the Aiken's V coefficient [31, 32]. The resulting instrument yielded a coefficient of 0.84, signifying adequate content validity for assessing professionalism [32, 33].

The identical ten principles were applied to explore students' views on the significance of professionalism within pharmacy practice [20]. Furthermore, 18 items modified from the Pharmacy Professionalism Instrument were included to examine students' perspectives on professionalism in pharmacy [26]. Responses to these items were collected via a 10-point Likert scale (1 = not important at all/strongly disagree; 10 = very important/strongly agree), enabling self-assessment of professionalism levels. Students also reported basic demographic information, such as gender and age.

Data collection and analysis

Surveys were distributed to students both before and after participation in the CPPE programme. Participant profiles were summarised using descriptive statistical methods. Due to the anonymous nature of the responses, individual pre- and post-programme data could not be linked. As a result, independent-samples t-tests were employed to detect any changes in responses between the two time points. Reliability of the scales was assessed through Cronbach's alpha coefficients [34, 35]. Analyses were conducted in SPSS version 26, with a predetermined alpha level of 0.05 for determining statistical significance.

Results and Discussion

Fifty-two students enrolled in the CPPE programme, with all 52 completing the pre-programme survey and 47 completing the post-programme survey. Among the participants, 27 (51.9%) were male, and the mean age was 20.92 years (SD = 0.97). Reliability testing revealed Cronbach's alpha values of 0.89 (pre-CPPE) and 0.93 (post-CPPE) for the scale assessing students' perceptions of the importance of professionalism in pharmacy practice. For the scale evaluating attitudes toward pharmacy professionalism, Cronbach's alpha values

were 0.91 (pre-CPPE) and 0.92 (post-CPPE). These coefficients confirmed that both instruments provided reliable measurements of professionalism among pharmacy students [35].

Table 1 presents the students' ratings regarding the perceived importance of various aspects of professionalism in pharmacy practice. Across both pre- and post-CPPE assessments, the tenets receiving the highest ratings were respect for others, communication, and duty. No statistically significant changes were observed in any of the ten professionalism tenets between the pre- and post-programme evaluations.

Table 1. Students' perceptions of the importance of professionalism in pharmacy practice [20]

Professional Value	Difference (Before to After) Mean (SD[a])	After CPPE (n = 47) Mean/Median (SD[a])	Before CPPE (n = 52) Mean/Median (SD[a])	p value[b]
Accountability	-0.10 (0.37)	8.40/9 (1.86)	8.50/9 (1.82)	0.797
Communication	0.35 (0.28)	9.21/10 (1.30)	8.87/9 (1.44)	0.213
Excellence	0.02 (0.30)	8.62/9 (1.51)	8.63/9 (1.47)	0.953
Respect for others	-0.08 (0.28)	9.00/10 (1.57)	9.08/10 (1.20)	0.784
Duty	0.24 (0.25)	9.09/10 (1.20)	8.85/9 (1.30)	0.346
Ethics	-0.11 (0.36)	8.02/8 (1.98)	8.13/8 (1.60)	0.314
Humanism	0.19 (0.38)	8.53/9 (2.03)	8.35/9 (1.76)	0.627
Teamwork	0.28 (0.39)	8.09/8 (1.61)	7.81/8 (2.22)	0.483
Altruism	0.16 (0.34)	8.64/10 (1.93)	8.48/9 (1.49)	0.648
Honour and Integrity	0.43 (0.36)	8.87/9 (1.80)	8.44/9 (1.82)	0.241

[a] SD refers to the Standard Deviation.
[b] Independent t-tests were used to analyze the results.

Table 2 highlights the differences in students' attitudes towards pharmacy professionalism before and after the CPPE, showing changes in both mean and median scores. Among the 18 assessed items, three showed significant positive shifts after the CPPE: altruism (not expecting anything in return for helping others, p = 0.035), accountability (being receptive to decisions made by authorities, p = 0.026), and duty (regularly attending required classes, clerkships, or work, p = 0.002).

Table 2. Displays the students' answers to the professionalism instrument items [26].

Item No.	Statement	Pre-to-Post Change Mean (SD)	After CPPE (n=47) Mean/Median (SD)	Before CPPE (n=52) Mean/Median (SD)	p-value
1	When helping others, I expect no reciprocation.	1.08 (0.50)	7.15/7 (2.39)	6.08/7 (2.57)	0.035
2	I consistently attend classes, clerkships, or work as required.	0.89 (0.29)	9.47/10 (1.04)	8.58/9 (1.74)	0.002
3	If I'm running late, I notify the relevant person as soon as possible.	0.30 (0.27)	9.30/10 (1.23)	9.00/9 (1.46)	0.277
4	When I fail to meet my obligations, I willingly accept the repercussions.	0.18 (0.40)	8.26/8 (1.95)	8.08/8 (1.98)	0.653
5	I strive to surpass what others expect of me.	0.58 (0.37)	8.60/9 (1.64)	8.02/8 (2.01)	0.123
6	Delivering high-quality work matters to me.	0.17 (0.24)	9.17/10 (1.26)	9.00/9 (1.16)	0.484
7	I finish my tasks on my own without needing oversight.	0.27 (0.33)	7.98/8 (1.62)	7.71/8 (1.66)	0.421
8	I reliably carry out my commitments.	0.43 (0.27)	9.02/10 (1.36)	8.60/9 (1.32)	0.118
9	I am dedicated to assisting others.	0.17 (0.38)	8.36/9 (1.96)	8.19/8 (1.81)	0.655
10	I would choose a role where I feel useful and can contribute meaningfully, even if the salary is lower.	0.23 (0.53)	6.40/7 (2.83)	6.17/7 (2.45)	0.662

11	Cheating for better outcomes is unacceptable.	0.47 (0.36)	9.23/10 (1.37)	8.77/10 (2.12)	0.195
12	I would disclose a medication mistake even if it went unnoticed by others.	0.24 (0.31)	8.30/8 (1.63)	8.06/8 (1.49)	0.445
13	I welcome feedback intended to help me improve.	-0.02 (0.29)	8.40/8 (1.42)	8.38/8 (1.47)	0.946
14	I show equal respect to every patient, irrespective of their social status or financial situation.	0.32 (0.29)	8.96/9 (1.10)	8.63/9 (1.70)	0.262
15	I use proper names and titles when addressing people.	0.18 (0.27)	8.85/9 (1.22)	8.67/9 (1.45)	0.512
16	I communicate ideas and opinions tactfully.	0.29 (0.32)	8.23/8 (1.59)	7.94/8 (1.59)	0.364
17	I respect and follow decisions made by authorities.	0.84 (0.37)	8.17/8 (1.51)	7.33/7 (2.12)	0.026
18	I show respect toward people from backgrounds different from my own.	0.11 (0.30)	8.98/9 (1.38)	8.87/9 (1.59)	0.706

Items 1, 9, and 16 correspond to altruism; items 2 and 3 correspond to duty; items 4 through 8 correspond to excellence; items 10 and 11 correspond to honour and integrity; items 12 and 17 correspond to accountability; items 13, 14, 15, and 18 correspond to respect for others.

[a] SD represents standard deviation

[b] Data were analysed with independent t-tests

This study investigated pharmacy students' views and attitudes towards professionalism during an experiential learning program in community pharmacies. Professionalism is a blend of knowledge, behaviors, and attitudes that is best developed through immersive, real-world learning experiences, fostering self-reflection and awareness [36]. The results indicated that students showed the highest post-CPPE scores in communication, a critical skill for daily operations in community pharmacies, which has been widely discussed in the literature [4, 37]. The CPPE likely provided a context where students could practice communication skills in a real-world setting, learning how to interact professionally in a dynamic environment shaped by peer support, preceptor modeling, patient interactions, and societal expectations [14]. Community pharmacists frequently engage in tasks like counseling patients, collaborating with colleagues, and negotiating with pharmaceutical companies [38, 39]. Pharmacy students, in their formative stages, are highly impressionable and often mimic the behaviors of their preceptors. Positive role modeling, therefore, plays a significant role in shaping professionalism [14]. Professional growth is shaped by role models (e.g., faculty, preceptors, peers), the learning environment, and clear institutional expectations [40]. These hands-on experiences in the CPPE may help explain why students showed notable shifts in their views on the importance of communication and teamwork in pharmacy professionalism.

Although most of the 18 items measuring students' attitudes towards professionalism improved post-CPPE, only three showed significant differences in mean scores. One reason for this could be a ceiling effect, where items that had already scored highly before the CPPE did not exhibit much change after the intervention. The students' responses showed notable improvements in altruism (helping others without expecting rewards), duty (showing up for work as required), and accountability (accepting decisions made by authority figures). These changes in attitudes are likely influenced by peer support, the practice environment, and societal expectations [16]. The impact of professional socialization is particularly strong in practice settings, where students learn professional norms through direct experience [5]. The CPPE serves as a space where students can practice professionalism, incorporating insights from direct-service encounters, shadowing pharmacists, and collaborating with other healthcare professionals, agencies, and peers. To succeed as part of a team, students must respect others' viewpoints and take responsibility for assigned tasks, ensuring smooth patient care processes.

Through experiential training in community pharmacies, students have the chance to interact with patients, observe pharmacists, and collaborate with peers from other schools. Such community-based training encourages pharmacy students to adopt teamwork, collaboration, and workflow skills, all of which are central to pharmacy professionalism (e.g., altruism). For example, a teachable moment might occur when a student witnesses a pharmacist skillfully managing a

difficult patient. Previous research has suggested that altruism, a core element of professionalism, is more effectively learned in community settings, likely due to stronger connections to the community than to hospital environments [41]. Further research is needed to explore how professionalism develops over time in pharmacy students.

This study marks the initial step in understanding how students' professionalism evolves, using a valid measurement instrument. However, there are several limitations. First, the study's findings are not broadly applicable, as it was conducted at a single pharmacy school, making the results preliminary. Future research should involve a more diverse group of participants and use comparison groups to validate these findings across various settings. Second, professionalism may vary depending on the working environment. Since the scale used in this study lacked specific context, students might provide different responses in different settings, which could limit the generalizability of the results. However, the scale used here could be a useful starting point for measuring professionalism-related attitudes among pharmacy students. Future studies should introduce context-specific scenarios and validate the scale across different environments for more reliable conclusions. Third, this study tracked changes in professionalism over a short 5-week period. It remains unclear whether these changes would persist over time, or if certain aspects of professionalism require a longer duration to develop. Future research should follow students over a longer period to assess the long-term effects on the retention of professionalism. Additionally, the global COVID-19 pandemic has had widespread consequences for healthcare, social systems, and education [42, 43]. The role of pharmacists in public health has gained recognition, but this has also come with an increased workload and stress for frontline professionals [44-46]. Future studies should investigate how students' perceptions of professionalism have shifted since the pandemic. Fourth, the self-reported nature of the professionalism scale may have led to inflated scores, not reflecting students' actual professionalism due to factors such as the Hawthorne effect, self-improvement bias, and testing bias. As a result, the changes in students' responses may suggest that the intervention affected how they answered the questions, rather than reflecting real improvements in their attitudes. Interestingly, there was a slight, though not statistically significant, decrease in students' perception of the importance of ethics. Future research could adopt a mixed-methods approach to explore the reasons and underlying mechanisms for specific changes in students' professionalism over time, particularly in response to the CPPE [47]. Such an approach would help identify key factors that influence professionalism, guiding pharmacy educators in adapting curricula for community settings. Ultimately, this will ease students' transitions into different professional environments in the future.

Conclusion

Pharmacy students' attitudes towards professionalism can be shaped through targeted experiential learning programs in community settings. These hands-on experiences help students develop more positive professional attitudes, better preparing them for practice in community pharmacy environments.

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