

RESEARCH ARTICLE

Pharmacy student and preceptor perceptions of elective introductory experiential learning

Sarah Peppard , Melissa Theesfeld 

Department of Pharmacy Practice, School of Pharmacy, Concordia University Wisconsin, Mequon, Wisconsin, United States

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Correspondence

Sarah Peppard
Department of Pharmacy Practice
School of Pharmacy
Concordia University Wisconsin
Wisconsin
United States
sarah.peppard@cuw.edu

Abstract

Background: Elective Introductory Pharmacy Practice Experiences (IPPEs) were created to expose students to specialised areas of pharmacy practice, provide options for experiential learning during the third professional (P3) year, and offer valuable experiences for students and sites prior to Advanced Pharmacy Practice Experiences (APPEs). This study sought to determine why students chose to take elective IPPEs and what rotation elements were perceived to be most valuable to preceptors and students. **Methods:** Elective, longitudinal IPPEs were offered each term of the P3 year. Students were surveyed before and after to determine their reasons for completing an elective IPPE and what aspects of the rotation were most valuable. Preceptors were surveyed to determine their perceived value of these rotations. **Results:** From 2015 to 2019, 124 students (37.5% of eligible students) participated in 139 elective IPPEs. Students selected gaining additional knowledge and skills as a top five reason to take an elective IPPE as 86.3%. Students most frequently cited professional development and enhanced understanding of pharmacist roles (24.2%) as the most valuable things learned. **Conclusion:** Elective IPPEs provided valuable experiences to students and preceptors. Students valued the opportunities to explore specialised areas of practice; preceptors found value in the required activities and the rotations professionally rewarding.

Introduction

Since 2006, the Accreditation Council for Pharmacy Education (ACPE) has required the inclusion of a minimum of 300 hours of Introductory Pharmacy Practice Experiences (IPPEs) for students enrolled in a Doctor of Pharmacy programme (ACPE, 2015). The goals of IPPEs are to provide opportunities for direct patient care while also preparing students for Advanced Pharmacy Practice Experiences (APPEs) (ACPE, 2015). ACPE requires that IPPEs are balanced between institutional and community pharmacy settings and that they are integrated with didactic coursework (ACPE, 2015).

Schools of pharmacy have implemented required IPPEs into their curriculum in a variety of ways (Galinski *et al.*, 2014). Surveys conducted after the implementation of the 2007 ACPE standards found that most schools (89%) began IPPEs during the first professional year and 43% of schools offered IPPE rotations throughout the

term as a longitudinal experience compared with 26% who offered IPPE rotations over breaks (Galinski *et al.*, 2014). A number of schools also began to offer IPPEs as a separate course (87.5%) and required four or more separate IPPE rotations (53%) (Galinski *et al.*, 2014; Devine & Darbishire, 2015).

The experiential education model includes dedicated weeks during each of the first four terms of the curriculum for required IPPE rotations. During the two-week period, students complete 40 hours of IPPE in both community and hospital environments. There are no didactic classes, labs, or exams on campus for that student cohort when they are completing required IPPEs. Student learning is focused on the experiential environment, where students apply the knowledge and skills they learn on campus. These required IPPEs include structured activities that integrate concepts from other concurrent courses and allow for real-world application and practice. As students move through the required IPPE curriculum, the activities become more

advanced and incorporate more patient care skills and drug therapy knowledge. By the end of the second professional (P2) year, each student has completed 160 hours of community IPPE and 160 hours of hospital IPPE, exceeding the ACPE requirement of 300 IPPE hours.

Although the required IPPE structure offers many benefits, including early exposure to pharmacy practice and application of patient care skills, it does not allow students to explore specialised areas of pharmacy practice and leaves an experiential learning gap in the third year of the curriculum. Required IPPEs are intentionally limited to traditional hospital and community pharmacy environments to assure optimal integration with the didactic curriculum. The Office of Experiential Education fields many requests from students each term for IPPEs focused on ambulatory care, long-term care, and other disease-specific specialities that cannot be accommodated in a required IPPE.

To address the limitations of the required IPPE structure, elective IPPEs for pharmacy students in their third professional (P3) year were created. These rotations were designed to expose students to specialised areas of pharmacy practice that are not part of the required IPPE curriculum, provide continued options for experiential learning during the P3 year, and offer valuable rotation experiences for students and rotation sites prior to APPEs.

Available literature demonstrates that required IPPEs are beneficial to students and experiential sites, however, the impact of IPPE hours that exceed ACPE requirements has not been previously documented (Mort *et al.*, 2010; Walker *et al.*, 2011; Mersfelder & Bouthillier, 2012; Yorra, 2014; McLaughlin *et al.*, 2015; Stanton *et al.*, 2017; Boyle *et al.*, 2020). The study

sought to determine why students chose to take elective IPPEs and what aspects of these rotations were perceived to be most valuable to preceptors and to students.

Methods

Elective IPPEs were designed as longitudinal rotations spanning an entire academic term. Each student spends a minimum of one 8-hour day per week at their elective IPPE rotation site for a minimum of 12 days over a complete 16-week term (Figure 1). Therefore, students who complete elective IPPE rotations amass an additional 96 IPPE hours above and beyond the 320 IPPE hours completed during required IPPEs. During the P3 year, students have fewer required classes and more opportunities to take elective courses. Students can choose from a variety of elective courses, including elective IPPEs and/or other classroom-based courses depending on their individual interests and goals. Unlike the required IPPE courses earlier in the curriculum, the elective IPPEs take place concurrently with other coursework and not in dedicated weeks of time. However, students' course schedules are built so that they do not have on-campus coursework that competes with their elective IPPE. Required courses for P3 students take place on Tuesdays and Thursdays. The remaining days of the week are reserved for labs and elective courses. Students who take elective IPPE courses reserve one day each week for their rotation and schedule their labs and remaining electives accordingly. Elective IPPEs are offered during both the Autumn and Spring terms of the P3 year, and students may choose to take the course during one, both, or none of the terms.

Year	Autumn term				Spring term				
	Weeks 1-6	Weeks 7-8	Weeks 9-10	Weeks 11-16	Weeks 1-6	Weeks 7-8	Week 9	Weeks 10-11	Weeks 12-17
P1	Classes	IPPE-1 ^a (80 hours)	Classes	Classes	Classes	IPPE-2 ^a (80 hours)	Spring break	Classes	Classes
P2	Classes	Classes	IPPE-3 ^a (80 hours)	Classes	Classes	Classes	Spring break	IPPE-4 ^a (80 hours)	Classes
P3	Elective IPPE-5 rotations (96 hours)				Elective IPPE-6 rotations (96 hours)				
P4	Advanced Pharmacy Practice Experiences every 6 weeks (1680-1920 hours)								

^a Each IPPE course (IPPE-1 through IPPE-4) is composed of 40 hours in a hospital pharmacy setting and 40 hours in a community pharmacy setting

Figure 1: Experiential education curricular overview

The Office of Experiential Education worked with engaged health systems and pharmacies who had expressed a desire for additional student involvement to collect elective IPPE availability. The availability request for elective IPPEs occurred separate from the annual request for required IPPE and APPE availability and focused on pharmacy practice partners who were geographically located within a 60-mile radius of the school of pharmacy. In addition to providing the course syllabus, the vision for these elective IPPEs was shared, the flexible and customisable nature of the experience was promoted, and experiential sites were encouraged to brainstorm project possibilities during the recruitment efforts. This resulted in elective IPPE offerings in a variety of practice settings. In alignment with the other rotation site assignment processes, students entered preferences if they were interested in participating in an elective IPPE. eValue was used to match students to a rotation based on their preferences and site availability. If students could not be matched to a practice setting from their preference list, they were not automatically assigned to another rotation.

Elective IPPE activities were designed to be much less prescriptive than the required IPPE activities, allowing students and preceptors to customise the experience based on the professional goals and needs of the practice. This also allowed the students to be more deeply integrated into the practice so that they become reliable members of the healthcare team. During an elective IPPE, each student completed a project to benefit the site/practice, a journal article review/discussion, and a drug information question. Students and preceptors worked collaboratively to find projects and topics that were interesting to the students and provided value to the practice. These requirements mimic the requirements of an elective APPE, further preparing students for more advanced experiential rotations. Students also maintained a professional portfolio to document their elective IPPE activities. Consistent with portfolio-based learning, the portfolio requires students to engage in critical reflection about their elective IPPE activities and experiences while also compiling evidence of their learning and professional development throughout the term (Driessen *et al.*, 2005; McKenna *et al.*, 2011).

Third-year pharmacy students enrolled in elective IPPE courses from Autumn 2015 through Spring 2019 were surveyed about their reasons for taking an elective IPPE course at the start of each term. The pre-survey was distributed by course faculty and conducted via Qualtrics. The survey consisted of one rank-order question about their reason for participating in an elective IPPE. Thirteen reasons/options were provided to students, as were

three open-response options for students to include their own rationale. Students were encouraged by course faculty to complete the survey, however, completion was optional and not linked to student performance in the course.

At the conclusion of each term, both preceptors and students were asked to complete surveys about their perceived value of the elective IPPE. The student survey was built using Qualtrics software and contained two open-response questions: "*What was the most valuable thing you have learned during this elective IPPE?*" and "*What was your least favourite aspect of this experience?*" The student responses were encouraged but not required. Student survey responses were anonymous to prevent any perceived coercion by the researchers. The preceptor survey was included at the end of their evaluation of the student performance in eValue, a Medhub software system. The preceptor survey included nine Likert scale questions about their level of agreement with value statements regarding the elective IPPEs and one open-response to the question "*In what ways did having an elective IPPE student on rotation bring value to you or your site?*" Preceptor responses were not anonymous, however, data was de-identified prior to analysis. All student and preceptor surveys were completed within two weeks of the end of the rotation.

Quantitative results of the survey were assessed through descriptive statistics using Excel 2016 and Qualtrics software in June 2020. Qualitative survey responses from each open response question in the preceptor and student surveys were initially reviewed and categorised into common themes individually by both authors. The categories were derived from the open-ended survey responses submitted by students and preceptors. The authors then met to review the individual categorisations from both surveys, discuss discrepancies, and promote consistency in coding and terminology. The data from the preceptor and student surveys was subsequently reviewed and categorised by both authors again for final analysis. Some responses were categorised into multiple themes. Student and preceptor data was analysed in aggregate as well as by academic year to evaluate trends and assure consistency in data. Key statements that helped to qualify each theme area were recorded and included as part of the results tables. This study was deemed exempt by the Concordia University Institutional Review Board.

Results

Elective IPPE recruitment for Autumn 2015 through Spring 2019 yielded 663 unique rotation opportunities across 35 types of practice settings (Table I). A total of 124 students (37.5% of eligible students) participated in 139 elective IPPEs, resulting in 524 surplus rotations. One hundred twenty (86.3%) elective IPPEs took place outside the traditional community and hospital settings that students experience during the required IPPE curriculum. The most frequent elective IPPE environments students chose were ambulatory care, behavioural health, critical care, acute care medicine, and hospital pharmacy administration (Table I).

Given the uniqueness of each rotation experience, responses from the 15 students who completed more than one elective IPPE were included in the analysis. A total of 139 responses (100%) were collected from the pre-rotation survey of students. Students' top reason for taking the elective IPPE was to gain additional knowledge and skills, with 86.3% of students selecting this reason in their top five (Figure 2). The next two most ranked reasons for taking an elective IPPE included gaining further exposure to the pharmacy profession (84.9%) and exposure to a specialised area of pharmacy practice (76.3%). Forty-six students (33.0%) ranked gaining exposure to a specialised area of pharmacy practice as the primary reason they selected an elective IPPE rotation. Similarly, additional exposure to the profession of pharmacy overall was ranked as the primary reason for taking an elective IPPE by 39 students (28.0%).

Table I: Elective introductory pharmacy practice experience rotations offerings and selections

Rotation type	Number of rotations offered	Number of rotations completed
Academia	4	4
Acute care	56	11
Spinal cord rehab	4	2
Ambulatory administration	23	4
Ambulatory care	61	27
Antimicrobial stewardship	1	1
Behavioural health	30	13
Cardiology	11	7
Community pharmacy	112	8
Community pharmacy administration	14	6
Critical care	22	12
Drug policy	22	3
Entrepreneurship	2	0
Geriatrics	3	3
Hospital pharmacy administration	82	10
Infectious disease	7	3
Infusion pharmacy	5	0
Investigational drugs	6	0
Long term care	37	4
Mail order/Home delivery	4	1
Managed care	9	0
Medication safety	2	0
Oncology	10	3
Paediatrics	4	2
Pharmacogenomics	4	0
Poison center	3	3
Population health	3	1
Professional organisations	1	1
Public health	6	1
Remote medication management	15	1
Research	40	1
Specialty pharmacy	44	6
Telepharmacy	4	0
Transitions of care	9	1
Underserved	3	0
Total	663	139

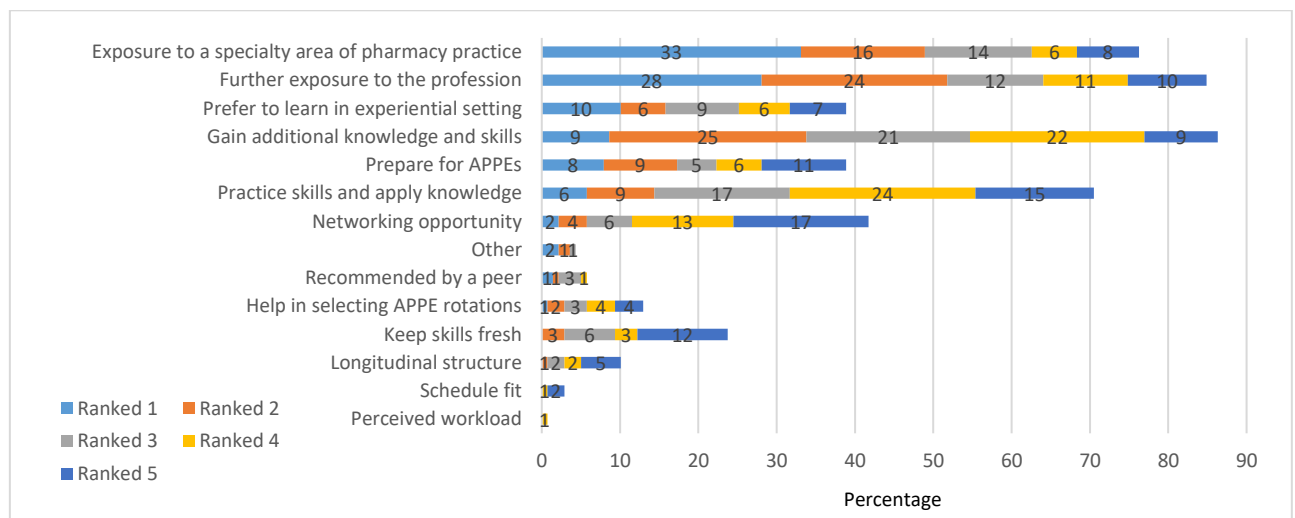


Figure 2: Students' ranked reasons for taking an elective introductory pharmacy practice experience course (N=139)

One hundred three students (74.1%) completed the post-rotation survey. Ninety-eight students submitted a response to the open-ended question of “*What was the most valuable thing you learned during the elective IPPE rotation?*” Student responses to this question were categorised into eight qualitative themes (Table II). Some student responses identified multiple valuable skills from the rotation, resulting in 120 total identified items. Students most frequently cited professional development and enhanced understanding of pharmacist roles and development of communication skills as the most valuable things learned during the

elective IPPEs (Table II). When data was evaluated by academic year, these major trends remained consistent over time with some minor variation from year to year. For example, 20–27.5% of responses ranked professional development and enhanced understanding of pharmacists’ roles as the most valuable thing learned each academic year. Practice and time management were identified as the second most valuable aspect (19.1% of responses) in the 2016–2017 academic year but were less commonly identified as valuable in other academic years (7.7–16.0% of responses).

Table II: Student perceptions of most valuable aspect of elective introductory pharmacy practice experience rotations (N = 120 student responses from 98 students)

Skill	N (%)	Characteristics
Pharmacist roles & professional development	29 (24.2)	<ul style="list-style-type: none"> • Understanding high quality of work expected of students • How to approach and handle difficult situations • Importance of continuing professional development • Understanding different career options and requirements to pursue certain career paths • Understanding pharmacists role in specialty area • Seeing impact pharmacists can have • Understanding the importance of growing the pharmacy profession
Communication skills	18 (15.0)	<ul style="list-style-type: none"> • How to be an effective communicator • How to communicate through a language barrier • How to respond when you don’t know an answer • Group presentation skills • Provider communication
Attitude & self-confidence	17 (14.2)	<ul style="list-style-type: none"> • Trust you have the abilities, knowledge, and resources to provide care and make appropriate decisions independently • Impact you can have even as a student • Identify weakness/areas for improvement • Importance of pushing yourself out of your comfort zone • Importance of being positive, practicing patience and self-motivation
Practice & time management	17 (14.2)	<ul style="list-style-type: none"> • Importance of tools and processes in place to help pharmacists care for patients • How to balance work tasks & budget time between multiple projects • Collaborative practice agreements • Order verification, transferring prescriptions, educating over the phone, documentation, etc.
Clinical knowledge & knowledge application	14 (11.7)	<ul style="list-style-type: none"> • Off label use of medications • Not relying on technology • Managing different conditions and patient scenarios (chronic, critical illness, etc.) • Developing drug therapy plans • IV/PO, renal dosing, pharmacokinetics
Patient assessment & monitoring	12 (10.0)	<ul style="list-style-type: none"> • Learning how to “<i>work-up</i>” and monitor a patient • Assessing patient lab values and vital signs • Identifying barriers to care for patients
Teamwork/interpersonal skills	9 (7.5)	<ul style="list-style-type: none"> • Impact of respecting and trusting team members on patient care • Importance of relationship building • Seeing how healthcare practitioners collaborate to provide the best patient care • Need for empathy with patients and withholding judgement
Research skills	4 (3.3)	<ul style="list-style-type: none"> • How to analyse results and draw appropriate conclusions • Analyse primary literature

One hundred one students (97.1%) responded to the question about the least valuable aspects of their elective IPPE. Nineteen students (18.8%) responded that the hours and workload of the rotation were the least valuable aspect, followed by rotation tasks (n=18, 17.8%), lack of patient interaction/rotation site limitations (n=17, 16.8%), required activities (n=12, 11.9%), preceptor abilities (n=10, 9.9%), parking/commute (n=7, 6.9%), and personal abilities/comfort (n=4, 4%).

One hundred thirty-nine preceptors (100%) completed the post-rotation survey. Ninety-nine preceptors (71.2%) responded to an open-ended question "In what ways did having an elective IPPE student on

rotation bring value to you or your site?" The preceptors' responses generated 154 items categorised into eight qualitative themes (Table III). The most common perceived value of elective IPPEs for preceptors related to project work. Forty responses (26.0%) from preceptors mentioned that elective IPPEs allowed them to complete project work that was useful to their practice or would have otherwise gone undone because of time restraints. Additionally, preceptors perceived value in the education that students provided to them, other members of the healthcare team, or patients during the elective IPPE rotation (22.7%). When preceptor data was evaluated by academic year, the most valuable elements remained consistent from year to year.

Table III: Perceived value of an elective IPPE rotation by preceptors (N=154 responses)

Attribute	N (%)	Characteristics
Project work	40 (26.0)	<ul style="list-style-type: none"> Projects completed in more timely fashion with dedicated student resource Create tools/proposals/etc. that will be useful in the future Completed research and gathered background materials
Educational	35 (22.7)	<ul style="list-style-type: none"> Daily discussions were educational for preceptor and student Student ideas lay groundwork for positive change in practice Outside/new opinions were refreshing and made others think
Decreased workload	28 (18.2)	<ul style="list-style-type: none"> Students were an extra set of hands Freed up preceptor time to focus on tasks/projects that would have otherwise gone undone Extra help in getting tasks completed
Professional satisfaction	17 (11.0)	<ul style="list-style-type: none"> Active involvement in training future professionals helps the community Pride in being a role model/mentor Pride in watching students (and future colleagues) grow
Patient care extender	16 (10.4)	<ul style="list-style-type: none"> Students were able to complete injections, transfers, appeal letters, etc. Provide patient education Perform patient monitoring
Preceptor development	10 (6.5)	<ul style="list-style-type: none"> Learn how to make educational experiences more robust Verbalising thoughts makes preceptors better teachers Learn what students are capable of to challenge their growth
Good attitude	5 (3.2)	<ul style="list-style-type: none"> Positive energy from students rubs off on others Enthusiasm is contagious
Job candidate evaluation	3 (1.9)	<ul style="list-style-type: none"> Assess for future fit with organisation

Preceptors were also asked to rank their level of agreement with several statements related to the elective IPPE on a four-point Likert scale (Table IV). All of the preceptors agreed or strongly agreed that having elective IPPE students was professionally rewarding. Preceptors also felt that the projects and journal clubs completed by elective IPPE students were valuable, with 99.3% and 97.1%, respectively, agreeing or strongly agreeing with these statements.

The elective IPPEs were also perceived as positive recruitment tools for future rotations and/or job opportunities by preceptors, with 95.0% agreement with this statement (Table IV). Of note, fewer preceptors (77.7%) agreed that having elective IPPE students helped them complete daily activities and only 56.8% agreed these students decreased the overall workload at their practice site.

Table IV: Preceptor-perceived value of elective introductory pharmacy practice rotations 2015–2019 (N=139 preceptor responses)

	Strongly agree/agree (%)	Disagree/strongly disagree (%)
Having an elective IPPE student on rotation is professionally rewarding to me	100.0	0.0
The longitudinal project completed by the student was valuable to my practice and/or practice site	99.3	0.7
The journal club discussion the student completed was valuable to my practice and/or practice site	97.1	2.9
Having an elective IPPE student on rotation provides valuable access to students as a recruitment tool for APPE rotations and/or job opportunities	95.0	5.0
I would like to have my elective IPPE student as a fellow pharmacist employee in the future	94.2	5.8
If possible, I would like to have my elective IPPE student back for an APPE rotation in the future	93.5	6.5
Having an elective IPPE student on rotation enhances patient care or pharmacy-related services in my practice setting	90.6	9.4
Having an elective IPPE student helps complete my daily activities	77.7	22.3
Having an elective IPPE student on rotation decreases the overall workload in my practice setting	56.8	43.2

Discussion

This study described the implementation of elective IPPEs during the P3 year. Students sought elective IPPEs to gain exposure to specialty areas of practice and additional insights into the profession of pharmacy. Additionally, the most valuable aspect of these IPPEs to students was the professional development and exposure to different pharmacist roles. However, these experiences were perceived by students to have a high workload. Preceptors found value in the project work completed by these students to be most valuable but less commonly agreed that elective IPPE students decreased their overall workload.

Exposure to a specialised pharmacy practice area and further exposure to the profession of pharmacy were the most frequently top-ranked reasons students chose to take elective IPPEs. These findings differ from previously published data on factors that influence students' APPE rotation selection (Shah *et al.*, 2020). This data indicated that location and distance were the most important factors to students when selecting APPEs. Interestingly, location-related concerns were infrequently listed as the least valuable aspect of elective IPPEs. This may be related to limiting elective IPPE site recruitment to the metro area surrounding the campus. Limited exposure to specialty areas of practice may also be related to the design of the experiential curriculum, which provides students with required IPPEs only in community and hospital settings. ACPE standards indicate that at least half of the required IPPE hours need to be balanced between community and institutional settings (ACPE, 2015). Specific practice

settings of required IPPEs are not currently well documented in the literature. Examples of IPPEs in certain specialised areas of practice exist, however, these rotation hours are often part of the required IPPE curriculum (Woelfel *et al.*, 2011; Vollman *et al.*, 2015; Ashjian *et al.*, 2021; Plott *et al.*, 2021). This study documents the valuable aspects of IPPEs that exceed the hours required by ACPE and are options for students to select that are in addition to the required IPPE curriculum. By ensuring exposure to specialised areas of practice, schools of pharmacy can allow students to further explore career options and see various pharmacist roles while developing important pharmacy practice skills when applying knowledge and skills.

The benefits of required introductory experiential education to students and institutions have been well documented in the literature (Mort *et al.*, 2010; Walker *et al.*, 2011; Mersfelder & Bouthillier, 2012; Yorra, 2014; McLaughlin *et al.*, 2015; Stanton *et al.*, 2017; Boyle *et al.*, 2020). For students, IPPEs have shown to increase self-esteem, enhance learning and development, foster an appreciation for pharmacy practice, and provide opportunities to inform career interests (Mort *et al.*, 2010; Walker *et al.*, 2011; Yorra, 2014; Plott *et al.*, 2021). Specifically, IPPEs during the third year of pharmacy school have been shown to help prepare students for APPEs by enhancing students' clinical skills and allowing them to acclimate to practice environments more quickly (Mort *et al.*, 2010). The study data indicate that some students value the professional development, exposure to pharmacist

roles, and improvement in self-confidence and communication skills that came from an elective IPPE.

Students' skills and knowledge are limited during the early years of the curriculum, and they are often not able to engage in all pharmacist activities during the required IPPEs. The inclusion of elective IPPE options for P3 students allows them to apply a higher level of skills and knowledge to the pharmacy practice. As advanced students, they can take on additional responsibilities in caring for patients, completing projects, and participating on the healthcare team. Gaining additional skills and knowledge was most commonly among the top five reasons students chose to take elective IPPEs. Qualitative results indicate that students developed skills in a number of important areas, including professional development, attitude, communication and time management. These softer skills are essential to students' development as future pharmacists and are highlighted as areas of importance within the ACPE standards (ACPE, 2015). Although not evaluated in the study, additional IPPE hours have been documented to provide students with opportunities to demonstrate their readiness for APPEs (Gilliam *et al.*, 2017). The knowledge and skills gained during elective IPPEs can be applied during APPEs. Additionally, the requirements of the elective IPPEs mimic those of an elective APPE, further preparing students for more advanced experiential rotations. The impact of elective IPPEs on APPE readiness and/or performance is an area for future study.

The benefits of introductory experiential rotations to experiential sites and patient care have also been documented (Walker *et al.*, 2011; Darbishire *et al.*, 2012; Mersfelder & Bouthillier, 2012). The data indicate that elective IPPEs are professionally rewarding and valuable to preceptors and practice sites. These findings are consistent with previous literature documenting the benefit of early experiential rotations to preceptors (Stanton *et al.*, 2017). Stanton and colleagues documented the preceptors' perceptions that early IPPEs are beneficial to the profession and professionally rewarding. Their data indicated that only 50–67% of preceptors agreed or strongly agreed that early IPPEs are beneficial to their practice site. The study data indicate that a higher percentage of preceptors agree that elective IPPEs in the third year of the curriculum enhance patient care at their site. Additionally, these rotations served as good recruitment opportunities for sites, with >90% of preceptors agreeing with statements related to future APPEs and job opportunities for their elective IPPE students. Fewer respondents agreed that elective IPPE students decreased their workload. However, decreased workload was the third most common valuable theme identified by preceptors. It is possible

that this difference was due to the variety of rotation types included in the analysis. This data can be helpful to schools in advertising the benefits of precepting students and may assist with site recruitment.

In particular, the project work was identified as a valuable component of elective IPPEs in both the quantitative and qualitative findings. This finding may be related to the longitudinal nature of the rotation and the ability of students to work on a project for the duration of a term. Even APPEs are often not long enough for students to see a project through to completion, whereas having a longitudinal student can overcome some of the time and logistical challenges of completing site-based projects/research. Students found value in a number of aspects of the project experience, including the development of time management skills and preparation for residency. Experiential sites found value in having student resources to work through projects that may not otherwise get done due to patient care and other pressing responsibilities. Working to include project requirements in experiential rotations can increase the value of the experience for both students and preceptors. Project management skills can be important for students during APPEs and the postgraduate training application process. Investigation of the role of elective IPPEs on APPE performance and in preparing students for postgraduate training are areas worthy of future exploration.

The positive response received from preceptors could also be related to the elective nature of these rotations. Elective rotation experiences are likely to attract motivated and interested students and preceptors, allowing for positive and productive rotation experiences for both parties. Additionally, the elective rotations have a few required activities to complete, but there is ample room to customise the experience and activities to meet the goals and interests of the student and Preceptor. As P3s, these students have completed more of the Doctor of Pharmacy curriculum, giving them more knowledge and skills than they had during the required IPPEs. These students can successfully understand, manage, and communicate with patients who have complicated disease states and medication regimens. They also have the necessary background and experience to better understand the administrative aspects of managing pharmacy teams and practices. While students still require supervision and oversight from a pharmacist, P3 students can perform more patient care tasks independently and serve as patient care extenders (Pharmacy Examining Board, 2020). All of these factors have contributed to site and preceptor engagement and the diverse, specialised elective IPPE options available to students.

This study successfully evaluated the reasons students choose to take elective IPPEs and the perceived value of the experience to students and preceptors. Strengths of this study include the high survey response rates for both students and preceptors. Additionally, in an effort to reach data saturation, study data was collected over a period of four years and reflects the perceptions of a large cohort of preceptors and students. The inclusion of quotes and descriptors of qualitative themes identified increases the transparency of the data.

Limitations of the study include the potential for recall bias as the value data was collected at the end of the rotation experience. This may have limited responses to elements of the rotation most recent in the respondents' mind and may not be reflective of the entire term experience. Efforts to limit recall bias involved surveying students and preceptors as close to the end of the rotation as possible. Although both authors independently reviewed qualitative data and agreed upon themes, there is room for interpretation, and an independent third party was not used. The Likert scale used to determine preceptor perceptions of elective IPPEs can help indicate which aspects did not work well for practice sites and preceptors, but preceptors were not explicitly asked to list the least valuable aspects of elective IPPEs. Additionally, the external validity of the results may be limited given that it is a single school's experience and the unique required IPPE model and overall curriculum structure allow for the implementation of elective IPPEs. However, the most valuable elements of rotations to preceptors and students discussed above are elements experiential teams can consider applying to existing experiential courses without major curricular adjustments. Finally, only 37.5% of eligible students completed elective IPPEs, and only 74.1% of these completed the final survey, which further limits the impact of the results. Attempts to limit and control for this limitation were made by using a large sample size and including data from four student cohorts.

Conclusion

Elective IPPEs provided valuable experiences to students and preceptors. Students valued the opportunities to explore specialised areas of pharmacy practice and different pharmacist roles. Preceptors found value in the projects completed by students and noted a sense of professional satisfaction. The role of these elective IPPEs on APPE preparedness and postgraduate training readiness are areas of future investigation.

Conflict of interest

All authors approved this manuscript submission and have no conflicts of interest to report.

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References

- ACPE. (2015). *Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree*. Accreditation Council for Pharmacy Education. <https://www.acpe-accredit.org/pharmd-program-accreditation/>
- Ashjian, E. J., Erickson, S. R., Walker, P. C., Sweet, B. V., Diez, H. L., Wells, T., & Thompson, A. N. (2021). The impact of an early clinical experience on pharmacy student learning about ambulatory care practice. *American Journal of Pharmaceutical Education*, *85*(4), 858118. <https://doi.org/10.5688/ajpe858118>
- Boyle, J. A., Jenkins, Z. N., Franz, T. T., Cather, C. W., Deitschmann, N. K., Harper, N. G., Dittmer, A., & Hartline, C. (2020). Evaluation of student perceptions of introductory pharmacy practice experiences. *Currents in Pharmacy Teaching & Learning*, *12*(6), 633–640. <https://doi.org/10.1016/j.cptl.2020.01.029>
- Darbishire, P. L., Plake, K. S., Kiersma, M. E., & White, J. K. (2012). An introductory pharmacy practice experience on improving medication adherence. *American Journal of Pharmaceutical Education*, *76*(3), 42. <https://doi.org/10.5688/ajpe76342>
- Devine, P. S., & Darbishire, P. L. (2015). National trends in IPPE programs at US schools of pharmacy from 2008-2013. *Research Survey*, *79*(3), 39. <https://doi.org/10.5688/ajpe79339>
- Driessen, E. W., Van Tartwijk, J., Overeem, K., Vermunt, J. D., & Van Der Vleuten, C. P. M. (2005). Conditions for successful reflective use of portfolios in undergraduate medical education. *Medical Education*, *39*(12), 1230–1235. <https://doi.org/10.1111/j.1365-2929.2005.02337.x>
- Galinski, C. N., Horosz, P. J., Spooner, J. J., & Kennedy, D. R. (2014). Comparison of introductory pharmacy practice experiences among US pharmacy programs. *American Journal of Pharmaceutical Education*, *78*(9), 162–162. <https://doi.org/10.5688/ajpe789162>
- Gilliam, E., Nuffer, W., Thompson, M., & Vande Griend, J. (2017). Design and activity evaluation of an advanced-introductory pharmacy practice experience (aIPPE) course for assessment of student APPE-readiness. *Currents in Pharmacy Teaching and Learning*, *9*(4), 595–604. <https://doi.org/10.1016/j.cptl.2017.03.028>

Mckenna, V., Connolly, C., & Hodgins, M. (2011). Usefulness of a competency-based reflective portfolio for student learning on a Masters Health Promotion programme. *Health Education Journal*, **70**(2), 170–175. <https://doi.org/10.1177/0017896910373135>

Mclaughlin, J. E., Amerine, L. B., Chen, S.-L., Luter, D. N., Arnall, J., Smith, S., Roth, M. T., Rodgers, P. T., Williams, D. M., & Pinelli, N. R. (2015). Early clinical experiences for second-year student pharmacists at an academic medical center. *American journal of pharmaceutical education*, **79**(9), 139. <https://doi.org/10.5688/ajpe799139>

Mersfelder, T. L., & Bouthillier, M. J. (2012). Value of the student pharmacist to experiential practice sites: A review of the literature. *Annals of Pharmacotherapy*, **46**(4), 541–548. <https://doi.org/10.1345/aph.1Q544>

Mort, J. R., Johnson, T. J., & Hedge, D. D. (2010). Impact of an introductory pharmacy practice experience on students' performance in an advanced practice experience. *Instructional Design and Assessment*, **74**(1), 11. <https://doi.org/10.5688/ai740111>

Pharmacy Examining Board. (2020). *Wisconsin administrative code PHAR 17.035 pharmacy internship*. https://docs.legis.wisconsin.gov/code/admin_code/phar/17.pdf

Plott, A. J., McIntosh, T., O'Ferral, H., Bennett, M. C., & Taylor, S. (2021). Impact of early direct patient care introductory pharmacy practice experiences on student pharmacists' career exploration. *Currents in Pharmacy Teaching & Learning*, **13**(2), 164–168. <https://doi.org/10.1016/j.cptl.2020.09.004>

Shah, V., Powers, K., Veltri, K., & Zarfoss, E. (2020). Factors that influence students' selection of advanced pharmacy practice experience. *American Journal of Pharmaceutical Education*, **84**(2), 7404. <https://doi.org/10.5688/ajpe7404>

Stanton, R. B., Kimble, C., Butt, M. T., Anderson, S. L., Broedel-Zaugg, K., & Anderson, H. G. (2017). The opinion of preceptors and students of very early IPPE rotations delivered concurrently with didactic courses. *Currents in Pharmacy Teaching and Learning*, **9**(1), 55–59. <https://doi.org/10.1016/j.cptl.2016.08.049>

Vollman, K. E., Adams, C. B., Shah, M. N., & Acquisto, N. M. (2015). Survey of emergency medicine pharmacy education opportunities for students and residents. *Hospital Pharmacy*, **50**(8), 690–699. <https://doi.org/10.1310/hpj5008-690>

Walker, P. C., Kinsey, K. S., Kraft, M. D., Mason, N. A., & Clark, J. S. (2011). Improving student education and patient care through an innovative introductory pharmacy practice experience. *American Journal of Health-System Pharmacy*, **68**(8), 655–660. <https://doi.org/10.2146/ajhp100490>

Woelfel, J. A., Boyce, E., & Patel, R. A. (2011). Geriatric care as an introductory pharmacy practice experience. *American Journal of Pharmaceutical Education*, **75**(6), 115. <https://doi.org/10.5688/ajpe756115>

Yorra, M. L. (2014). Self-efficacy and self-esteem in third-year pharmacy students. *American Journal of Pharmaceutical Education*, **78**(7), 134. <https://doi.org/10.5688/ajpe787134>