PHARMACIST & TECHNICIAN CE:

Preceptor Perceived Value from Pharmacy Practice Development Projects During Advanced Pharmacy Practice Experiences

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CE FOR **PHARMACISTS & TECHNICIANS**

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Learning Objectives

- List the major categories of practice development projects students on advanced pharmacy practice experiences (APPEs) complete
- Describe the value APPE practice development projects contributes to rotation sites
- Compare which practice development projects increase value to preceptors in different practice settings
- Describe ways preceptors can increase the value of their practice development projects

Teaching and mentoring pharmacy students on advanced pharmacy practice experiences (APPEs) can be incredibly rewarding for preceptors, but often requires a significant time commitment.[1-3] Fortunately, pharmacy students can add value to the rotation site to help offset the time spent on training.[3-10] Pharmacy students can increase value by completing comprehensive medication reviews, providing patient education, making therapeutic recommendations, and taking high-quality medication histories. Additionally, clinical interventions and daily contributions provided by pharmacy students can lead to cost savings for APPE sites.[7-10] An additional way preceptors can facilitate site value from pharmacy students is through project completion.[2,3,11]

The University of Wisconsin-Madison School of Pharmacy (UW-Madison SOP) implemented pharmacy practice development projects into elective APPEs in 2000. UW-Madison strongly embraces the Wisconsin Idea, a long-standing belief that education should give back to the community and environment beyond learning in the classroom.[12] The pharmacy practice development projects support the Wisconsin Idea by having a positive impact on APPE sites, patients, and the community. The projects serve multiple purposes, including promoting the profession of pharmacy, facilitating student project management skills, and adding value to the pharmacy site. Through these projects, students strengthen their project management and practice development skills in order to ultimately become more competitive for jobs and residencies.

With few exceptions, students at UW-Madison SOP are required to complete a pharmacy practice development project for each of their six-week elective APPEs. Most students complete three to four elective APPEs and, therefore, three to four pharmacy practice development projects throughout their fourth year. The elective APPE can be completed at a variety of direct patient care and non-patient care sites, including managed care, pediatric intensive care, academic, long-term care, and specialty pharmacy. Preceptors select the pharmacy practice development projects based on what they think will add value to their practice site. Any project the preceptor feels would be beneficial is appropriate for the required assignment; examples of past projects can be found in Figure 1. These include medication use evaluations (MUEs); developing educational materials for patients, pharmacy, or medical staff; updating site clinical guidelines; and helping to develop new workflows or pharmacy services (e.g., implementing med-sync or revising a medication error reporting system). The APPE preceptor evaluates the pharmacy student's performance and quality of the project using a rubric that includes the project title; the preceptor evaluation of the student's process, timeliness, and quality of final project; and the prompt, "Please describe the value this student project adds to your practice site." The evaluation is submitted online to the experiential database and is a component of the student's final letter grade for the rotation.

It is currently unknown to what extent the pharmacy practice development projects are adding value to pharmacy sites. The primary objective of this analysis was to determine how the pharmacy practice development projects added value from the preceptors' perspective and to identify what

FIGURE 1. Examples of Student Projects

Inservice Projects

- Drugs in Breast/chest feeding
- Drugs in Dialysis
- Drug class updates
- Hepatitis C
- Transplant
- Weight loss
- Guideline Updates
- Asthma
- COPD
- Diabetes
- Hyperlipidemia
- Hypertension
- Schizophrenia
- Hypokalemia Protocol / Inservice
- Medications and Genetics
- Medication Errors / Workflow
- Pain Medications During Labor

DUE/MUE Projects

- Concentrated insulin
- Penicillin allergy appropriateness
- Pneumococcal vaccine in nursing home
- PPI utilization
- TNF-alpha inhibitor hep B and TB screening

Patient Education Projects

- Asthma education
- Cholesterol management
- Grapefruit interactions
- HTN screening
- Immunizations
- Lyme disease prevention
- OTC information
- Patient safety projects
- Sinusitis guidelines
- Tobacco treatment

Other Projects

- Assessment of asthma care for mail order
- Assessment of nursing home pharmacy services
- Assist with research being conducted at rotation site
- Chemo dose rounding protocol/algorithm
- Cost analysis of infusion pump hardware
- Cost analysis of fentanyl vial size for anesthesiology
- Development / assessment of a new pharmacist service / role
- Development of collaborative practice agreement/protocol
- Develop recommendations for P&T committee
- Dosing standardization / building order sets
- Health literacy: identifying and addressing
- Immunization reminders and promotion
- New hire / onboarding handbook
- New medication monographs
- Osteoporosis screen / protocol
- Patient consultation projects
- Pharmacist billing for cognitive services
- Pharmacist handoff procedure
- Prepare information to aid in pharmacy business decisions (e.g., cost-benefit analysis)
- Reducing controlled substance waste
- Reference guide for specialty medications
- Renal dosing in LTCF
- Retrospective review of drug-drug interactions

types of pharmacy practice development projects most frequently added high value. This information can be shared to help APPE sites optimize the value that can be gained from pharmacy practice development projects and learn how pharmacy students can help advance pharmacy practice.

Methods

This retrospective analysis examined preceptors' perceptions of the value that pharmacy practice development projects added to their sites. A report was generated from the UW-Madison SOP experiential database from June 2017 through December 2018 (a total of 13 six-week APPE cycles). The database included the project title, the preceptor answer to "Please describe the value this student project adds to your practice site," the type of rotation (e.g., health system, community, or other), a rural/urban designation, and a patient care or non-patient care designation. Student names and the project evaluation scores were removed to keep the analysis anonymous.

Three investigators (KJ, PE, and AM) independently reviewed the first 50 project entries and created categories for the different project types, value outcomes, and specific phrases that designated high value. These categories were used to create a codebook to complete the content analysis. Prior to finalizing the codebook, the categories and definitions were discussed until the group came to a consensus. The final codebook contained 12 project categories (definitions and examples in Table 1), and 15 value outcomes (definitions and examples in Table 2), including a category to designate high-value projects. The value outcomes were explicitly based on what preceptors submitted at the time of the project evaluation. "High-value" projects were determined based on the specific wording listed in Figure 2. Each project was given one project type designation unless the project had two parts that fit more than one category. Projects could have more than one value outcome. For example, a project could contribute value outcomes in both monetary ways and in increased patient safety if the preceptor stated both.

After the codebook was finalized, two investigators (KJ and PE) independently coded the first 200 projects and compared coding for consistency. The next 500 projects were split between the two investigators. To maintain coding consistency between the two investigators, every third data point was checked by the other investigator. This is a commonly used qualitative research technique to increase data accuracy and minimize bias. Discrepancies were discussed between the two investigators. If the discrepancy was not easily resolved, a third investigator (AM) helped decide how to code the entry. If the project type could not be determined from the report, the third investigator, who was also an elective APPE course coordinator, obtained additional information from the full project evaluation and student presentation assignment (a complementary project presentation students complete as another rotation assignment). Project entries were considered unusable when there was not enough information to determine the project type or when the value question was not described by the preceptor on the evaluation form.

A quantitative data analysis was completed by determining the frequency of each project type and value outcome using descriptive statistics. The primary analysis was high-value designations within project type, and high-value designations within value outcomes. Secondary analyses were done to compare project types by site description, patient care or non-patient care, and rural or urban setting. Inferential statistics were conducted when comparing project types between site variables. All statistical inference comparisons used a Fischer's exact test with a two-sided alpha level of 0.05 indicating statistical significance. No adjustments were made for repeated tests. The analysis was performed using StataSE version 14.2. This analysis was certified as a quality assurance project by the University of Wisconsin-Madison Education and Social/Behavioral Science Institutional Review Board.

Results

There were 822 evaluations completed by preceptors for student rotations, with 19 deemed as unusable due to not having enough information to determine the project type or an incomplete value question by the preceptor. During coding, 138 projects needed more information to determine accurate project type. In those cases, the APPE coordinator was able to extract that information from either the full preceptor evaluation or the students' project presentation assignments. There were 119 projects designated as high-value (14.5% of evaluated projects).

The most common project types (Table 1) were 1) developed provider or pharmacy educational materials (21.2%), 2) improved process (20.2%), and 3) performed MUE (14%). Business proposal projects had the highest proportion of being designated as high-value (50%) but with only 4 projects in that category, it was a rare project type. Other project types with high proportions of high-value projects included: expanded current pharmacy service or updated materials (26.2%), developed a pharmacy service (22.4%), improved patient education (18.5%), and improved process (16.3%).

Table 2 includes definitions for the value outcomes, with the most frequent outcomes being 1) increased pharmacy staff or clinical staff knowledge (31.9%), 2) provided information about pharmacy site or for the pharmacy site to use (20%), and 3) improved patients' pharmacy or health care system experience (11.7%).The value outcomes with the highest proportion of preceptors suggesting the project was high-value was increased adherence (33.3%); however, there were only 21 instances within that value outcome. Projects that brought monetary value to a site were high-value 27.8% of the time, and those that improved patients' pharmacy or health care experience also were high-value 22.3% of the time.

Considering the projects conducted within different pharmacy settings, 54 out of 411 rotations were designated as high-value (13%) in health system rotations; 43 out of 142 rotations (30.3%) in the community setting; and 20 out 151 (13.2%, p=0.001) in "other" types of health settings. The distribution of each project type by rotation characteristics can be found in Table 3. Notably, 82.6% of MUEs, 78.9% of P&T committee materials, 70.3% of updated clinical guidelines or protocols, and 65.5% of inservices or education presentations for clinical staff were conducted within health systems (all with p<0.05 compared to other settings). In the community pharmacy setting, there was a higher rate of expansion of pharmacy services or updating materials (55.4%) and patient education (51.9%) projects (both with p<0.001).

Among rotations that focused on direct patient care, 92 out of 548 projects were designated as high-value (16.8%) compared to 25 out of 156 projects of rotations that were non-direct patient care (16%). These rates were similar and not statistically significantly different (p=0.91). There was a statistically significantly higher number of direct patient care rotation projects, as opposed to non-direct patient care rotations projects, seen across all project categories except for three (Table 3).

Lastly, among urban rotations, 110 out of 663 rotations were designated as high-value (16.6%) compared to 7 out of 41 projects among rural rotations (17%); this was not statistically significantly different (p=1.00). The number of projects conducted at urban rotation sites was consistently higher than rural rotations (Table 3). This

FIGURE 2. High-Value or Other Overly Positive Statements

High-Value Designation	*Non-high Value Designation*
"Added great value"	"Potential" for high value
"High value"	"great" with no further explanation
"Huge value"	"adds value"
"Very valuable"	"very useful"
"Huge asset to our site"	"very helpful"
"Invaluable"	"great results"
"Project will save lives"	"very valuable" statements without additional overly positive statements"
"Extremely valuable"	Overly positive statements describing high quality work
"Adds a lot of value"	
"Tremendous value"	
"Incredible value"	
"Immense value"	
"Meaningful piece of work"	
"Allows us to provide exceptional care"	
"Significant impact"	
"Extremely helpful"	
"Project is essential"	
"Very useful", "very helpful", "great benefit", with additional overly positive statements included about how the site has benefited from the project	

TABLE 1. Project Types Definitions and Counts (n=822 projects)

Projects Type	*Definition*	*Example*	*Count n (%)*	*High Value within Project Type n (%)*
Developed provider or pharmacy educational material(s)	Develop tools, handouts, presentations, etc. to educate pharmacy staff, pharmacy learners, or other health care providers	*"Urinary incontinence resources for nursing and pharmacy staff"*	174 (21.2)	19 (10.9)
Improved process	Develop and/or implement workflow changes to save time or reduce errors Evaluate errors, productivity, impact from interventions, staff satisfaction, patient satisfaction, etc.	*"Reducing controlled substance waste in a children's hospital"*	166 (20.2)	27 (16.3)
Performed MUE	Collect data to evaluate how medications are used at pharmacy site	*"[proton pump inhibitor] utilization evaluation"*	115 (14)	14 (12.2)
Presented Inservice/education for clinical staff	Present educational topic to pharmacy and/or clinical staff	*"Preoperative antibiotic inservice"*	87 (10.6)	11 (12.6)
Expanded current pharmacy service or updated materials	Update tools or materials for a current service or expand current pharmacy service through increased outreach	*"Expanded immunization program"*	65 (7.9)	17 (26.2)
Developed or updated clinical guidelines or protocols	Create or update site clinical guidelines or institutional protocols	*"Pediatric community acquired pneumonia guideline"*	64 (7.8)	7 (10.9)
Improved patient education	Develop informational handout or present educational topic to patients	*"Inhaler device patient education materials"*	54 (6.6)	10 (18.5)
Developed a pharmacy service	Develop and/or implement tools, materials, or workflow for a new pharmacy service	*"[Medication therapy management] program development"*	49 (5.9)	11 (22.4)
Developed recommendations for P&T committee	Prepare and/or present cost comparisons, drug monographs, etc. for P&T committee meetings	*"[Direct oral anticoagulant] new drug/drug class review monograph for [organization] P&T"*	38 (4.6)	3 (7.9)
Prepared a business proposal	Prepare information such as a cost-benefit analysis to aid in pharmacy business decisions	*"[Pharmacy name]: a business proposal"*	4 (0.5)	2 (50)
Other	Collect data for non-MUE research project, perform research for the site, help the site adhere to corporate requirements, etc.	*"Heart failure data collection"*	18 (2.2)	3 (16.7)
Not Usable		*"USP 800"*	19 (2.3)	NA

MUE = medication use evaluation; P&T = Pharmacy and Therapeutics

was consistent with the general distribution of urban and rural rotations. However, none of these were statistically significantly different proportions, except for "developed or updated clinical guidelines or protocols" which was only performed as a project on urban rotations and was statistically significantly different (P=0.027).

Discussion

Based on preceptors; comments related to the value their APPE students' projects brought to their sites, we found that 14.5% of projects were determined to be high-value through this analysis. Projects types with a higher proportion of high-value projects were: expanded current pharmacy service or updated materials; developed a pharmacy service; improved patient education; and improved process. These projects often improved the site utilization of a service, helped learn about the current practice, or increased knowledge for clinical staff. We hope preceptors can use the results from this evaluation to generation ideas for high-value student projects at their practices. Specifically, preceptors are encouraged to use Figure 1 and Table 1 when brainstorming potential projects.

The value of similar student projects and activities (similar to those we've described as high-value in this analysis) has been highlighted in the past.[11,13,14] For example, Cannon and colleagues demonstrated that APPE students added value to pharmacy sites through population health management projects (i.e. expansion of pharmacy services).[11] Students were given lists of patients to review and independently reviewed the electronic medical record and identified actionable interventions (e.g., non-adherence to dual antiplatelet therapy within one year of coronary stent placement or with renal dysfunction and requiring dose adjustment of lipid-lowering therapy). In addition to improving patient care, these student projects saved approximately 18 hours of preceptor time per APPE student.[11] Preceptors take on a large responsibility when APPE students are learning at their pharmacy sites, and the completion of the practice development projects are one way for students to give back to their preceptors and sites.[3,11]

A higher proportion of projects designated as high-value were found within the community pharmacy settings.

TABLE 2. Value Outcomes Definitions and Counts (n=803 projects)

Value	*Definition*	*Example*	*Count n (%)*	*High value within value type n (%)*
Increased pharmacy staff or clinical staff knowledge	Project increased pharmacy or clinical staff knowledge through a presentation or by providing other educational materials	*"This project helped the nursing staff in the Outpatient Surgery Center more fully understand antibiotic therapy in their area."*	256 (31.9)	31 (12.1)
Provided information about pharmacy site or for the pharmacy site to use	Project provided the site more information such as MUE results, quality assurance results, or research for P&T committees	*"Helps us determine our compliance with the recommended weight based limits in our [direct oral anticoagulant] patient population."*	161 (20)	22 (13.7)
Improved patients' pharmacy or health care system experience	Project created medication educational materials for patients, improved patients' access to care, improved patient outcomes, or increased patients' trust in pharmacists as health care providers	*"Excessive use of sliding scale insulin in [Rotation name] is a huge problem. [Student's] project will literally save lives and increase patients quality of life. Direct feedback from our medical providers looks positive for changing prescribing habits based on [Student's] intervention."*	94 (11.7)	21 (22.3)
Optimized therapy	Project increased use of appropriate therapies, decreased use of inappropriate therapies, optimized medication doses, or increased vaccination rates	*"The data [they] collected will help us to evaluate the appropriateness of twice daily [proton pump inhibitors] in pediatric children. The hope is that we will be able to use this data to reduce inappropriate use among physicians, and ensure patients do not go home with inappropriate therapy."*	92 (11.5)	17 (28.5)
Improved work environment/work site	Project improved workflow, decreased errors, improved employee satisfaction, improved Medicare Star Ratings, etc.	*"This form will eventually be made into a template that will hopefully be used on all patient transfer with the intent of making med rec simpler at the time of transfer. [Student's] pilot project proved to be useful in the [intensive care unit] setting."*	91 (11.3)	19 (20.9)
Increased patient safety	Project increased safety by decreasing medication errors, unsafe medication use, or interactions between medications	*"Cardiac device infections are becoming more common and appropriate/timely treatment is critical to prevent devastating complications to the patient."*	67 (8.3)	7 (10.5)
Saved time	Project saved pharmacy staff time by increasing efficiency or improving workflow process	*"The learning module is important for training new pharmacists and techs and as a yearly refresher for pharmacy staff. The reference tool for updating the module will help save time in future years. This was a valuable project for ensuring appropriate administration and documentation of influenza vaccine administered by community pharmacy staff."*	56 (6.9)	10 (17.9)
Saved money	Project increased profit or decreased costs for pharmacy or patients	*"The project has added tremendous value to our patients as well as increasing revenue in the pharmacy. [They have] done a great job of promoting [Pharmacy] as an immunization resource. Overall we would like to continue this work as we move forward with our staff and other students."*	54 (6.7)	15 (27.8)
Expanded service	Project created a pharmacy service or expanded a current pharmacy service	*"This project is very important as it relates to current initiatives and creates a framework for the continued development of projects related to medical drug management. [They] did an excellent job researching the justification for criteria and creating a framework for a standardized process moving forward."*	41 (5.1)	8 (19.5)
Increased patients' awareness of services offered by pharmacy	Project promoted pharmacy services such as vaccinations	*"The project has added tremendous value to our patients as well as increasing revenue in the pharmacy. [They have] done a great job of promoting [Pharmacy] as an immunization resource. Overall we would like to continue this work as we move forward with our staff and other students."*	41 (5.1)	6 (14.6)
Increased trainee learning	Project developed materials for onboarding of new trainees or created materials for trainees to learn clinical and institutional guidelines. Trainees could be students, residents, interns, etc.	*"Having these statistics discussion guides will streamline and organize our preparation and topic discussion with our pharmacy residents."*	40 (5)	6 (15)

TABLE 2. Value Outcomes Definitions and Counts (n=803 projects) Cont.

Value	Definition	Example	Count n (%)	High value within value type n (%)
Increased adherence	Project created or improved medication synchronization programs or improved adherence for patients through interventions	*"Highly valuable as it will help model a pharmacist provider-based engagement and health education platform to improve adherence and outcomes."*	21 (2.6)	7 (33.3)
Increased pharmacy rapport with other health care providers	Project demonstrated the value pharmacy staff can add to interprofessional teams	*"This project is of great value to the pharmacy. We no longer have a delay in getting a patient started on smoking cessation potentially missing the key window of motivation for the patient. It further enforces our trust relationship with the patients and providers to contact with medication and health questions or concerns."*	13 (1.6)	4 (30.8)
Strengthened pharmacist/patient relationship	Project demonstrated and increased relationship with the pharmacist has with patients	*"This project is of great value to the pharmacy. We no longer have a delay in getting a patient started on smoking cessation potentially missing the key window of motivation for the patient. It further enforces our trust relationship with the patients and providers to contact with medication and health questions or concerns."*	5 (0.6)	3 (60)
Poor Quality	Project did not provide value to APPE site	*"Unfortunately, this project did not provide us with much value. It will need to be rewritten in order to appropriately convey the information that is needed."*	2 (0.3)	0 (0)

MUE = medication use evaluation; P&T = Pharmacy and Therapeutics; APPE = advanced pharmacy practice experience

When considering the workflow in community pharmacies and the limited ability of staffing pharmacists to step out of patient care activities to complete a project, this finding is not surprising. It is well documented that two common limitations to implementing new projects in community pharmacy are time and workflow.[15-18] By having an APPE student complete needed projects, they had an additional well-trained individual available to assist with project implementation.[3]

Another way for sites to increase the value of projects is to consider the department's strategic plan and how an APPE practice development project could facilitate a department goal.[19] Rotation sites or pharmacy departments may also consider developing a practice development project board to help brainstorm, track, and assign projects to increase value to the rotation site. Additionally, preceptors or practice development project boards may consider larger projects that can be strategically split longitudinally among multiple APPE students. For example, a first student may perform a gap analysis, a second student may implement a process improvement, and a third student may evaluate the impact of the process change. Additional details on these techniques can be found in Precepting Tips: Precepting Research Projects for Success.[19]

In addition to choosing a meaningful project, preceptors can also increase the value of a practice development project by minimizing the pharmacist and site resources used to achieve the project. There are two well-documented models to consider for resource minimization of APPE practice development projects: layered learning and team precepting. Layered learning is when a senior learner precepts a junior learner who are both supervised by a preceptor.[20] Several articles have described successful use of layered learning, often with residents precepting students, for student research or projects.[21,22] Benefits included expanded capacity of pharmacists to take students and resident opportunities to precept while still receiving feedback from preceptors.[23] However, this arrangement can make some activities take longer for preceptors, as they need to set expectations and assess both student and resident performance. For more guidance on layered learning, please see Meeting Challenges with Layered Learning.[20] A second model to minimize the preceptor time needed to facilitate a project may be team precepting. It is not unusual for the same pharmacist to consistently serve as the primary or secondary preceptor, which can lead to increased rates of burnout.[24] In team teaching, multiple preceptors can share the precepting responsibilities; in this scenario, a specific preceptor may manage the practice development project while other preceptors are responsible for the final student evaluation or other assignments and activities.[24] Beecroft and colleagues also present evidence that suggests team precepting increases nurses' satisfaction with precepting.[25]

The value to the site is not the only consideration when selecting a practice development project. Many preceptors also consider what will be a good learning experience for their APPE student. Kolbs Experiential Learning Theory explains that learning in higher education should focus on a process with feedback on how the student is learning and their efforts, in order for the student to grow their learning, and be able to integrate their learning into the real world.[26] Practice development projects completed by students throughout their elective APPEs allow adult students to be in a real-world pharmacy practice setting to grow their knowledge of the profession. The purpose of completing these projects is not only to allow student at the site to advance their careers by developing professional independence and enhancing their communication skills, but also to help the pharmacy sites and preceptors with whom

TABLE 3. Project Type by Rotation Characteristics (n=803 projects)

Categories	Health system (n=465) n (%)	Community/ Retail (n=185) n (%)	Other (n=171) n (%)	P-Value	Patient care n (%)	Non-patient care n (%)	P-Value	Urban n (%)	Rural n (%)	P-Value
Developed provider or pharmacy educational material(s)	98 (56.3)	42 (24.1)	34 (19.5)	0.81	141 (81)	33 (18.9)	0.3	167 (96)	7 (4)	0.28
Improved process	91 (54.8)	40 (24.1)	35 (21.1)	0.82	115 (69.3)	51 (30.7)	0.003	155 (93.4)	11 (6.6)	0.58
Performed MUE	95 (82.6)	5 (4.6)	15 (13)	<0.001	105 (91.3)	10 (8.7)	<0.001	108 (93.9)	7 (6.1)	0.83
Presented Inservice/ education for clinical staff	57 (65.5)	11 (12.6)	19 (21.8)	0.05	76 (87.4)	11 (12.6)	0.03	83 (95.4)	4 (4.6)	0.81
Expanded current pharmacy service or updated materials	17 (26.2)	36 (55.4)	12 (18.5)	<0.001	49 (75.4)	16 (24.6)	0.64	60 (92.3)	5 (7.7)	0.58
Developed or updated clinical guidelines or protocols	45 (70.3)	6 (9.4)	13 (20.3)	0.02	61 (95.3)	3 (4.7)	<0.001	64 (100)	0 (0)	0.03
Improved patient education	19 (35.2)	28 (51.9)	7 (12.9)	<0.001	51 (94.4)	3 (5.6)	0.001	50 (92.6)	4 (7.4)	0.55
Developed a pharmacy service	15 (30.6)	15 (30.6)	19 (38.8)	<0.001	28 (57.1)	21 (42.9)	0.001	43 (87.8)	6 (12.2)	0.06
Developed recommendations for P&T committee	30 (78.9)	1 (2.6)	7 (18.4)	0.002	23 (60.5)	15 (39.5)	0.01	38 (100)	0 (0)	0.16
Prepared a business proposal	2 (50)	1 (25)	1 (25)	1.00	2 (50)	2 (50)	0.21	4 (100)	0 (0)	1.00
Other	6 (33.3)	4 (22.2)	8 (44.4)	0.048	10 (55.6)	8 (44.4)	0.04	16 (88.8)	2 (11.1)	0.28

p-values are comparisons of the specific project type compared between the rotation characteristic
MUE = medication use evaluation; P&T = Pharmacy and Therapeutics

students work.

There are several limitations to this analysis. This analysis is based on preceptor perception, making it subjective, and perceptions may vary depending on the individual completing the form and their own expectations. Additionally, as the value statement was part of the preceptor evaluation of students' projects, there may also be rater biases observed within this report. Most notably, a potential halo effect could influence these results. This is where preceptors who appreciate the students or have positive perceptions of a student may evaluate their work according to student characteristics as much as behaviors or the quality of their work.[27] Another notable limitation to this analysis is the timing of the projects included. These projects were conducted and evaluated from the summer of 2017 through the fall of 2018, which was prior to the COVID-19 pandemic. It is suspected that COVID-19 may have influenced both the types of projects conducted and the value preceptors would have assigned. However, anecdotally, in reviewing student project presentations over time, the types of projects conducted during and after the main phase of the pandemic could also be categorized in a similar manner and the information presented can be extrapolated to current project idea generation.

Conclusion

The goal for this analysis was to assist preceptors in determining practice development project ideas for their APPE students that will be the most beneficial for their practice, while allowing the students to continue to master their project management skills. We encourage preceptors to use Figure 1 and Table 1 when brainstorming potential projects. Preceptors could consider projects to expand current pharmacy service, update materials, develop a pharmacy service, improve patient education, and improve processes, as those project types were found to have a higher proportion of the high-value terms in preceptor evaluations.

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Assessment Questions

1. Which list describes the most common practice development project types?
   a. Develop provider or pharmacy educational materials, process improvement, and medication use evaluation
   b. Expansion of current pharmacy service or updating materials and patient education
   c. Develop provider or pharmacy educational materials and develop or update clinical guidelines or protocols
   d. Develop or update clinical guidelines or protocols, process improvement, and medication use evaluation
2. Which of the following statements would be considered high-value for this analysis?
   a. The student did a great job on their project! We learned a lot about our prescription trends at the pharmacy.
   b. This project will be very useful for the pharmacists on staff.
   c. This project has the potential for high-value as it is expected to increase patient adherence.
   d. The development of the new service was extremely helpful and allows us to continue to provide exceptional care.
3. What proportion of projects were determined to be high-value?
   a. 2.3%
   b. 14.5%
   c. 26.2%
   d. 33.3%
4. Which was the most common way projects brought value to the rotation site?
   a. Improved work environment/work site
   b. Provided information about pharmacy site or for the pharmacy site to use
   c. Increased pharmacy staff or clinical staff knowledge
   d. Improved patients' pharmacy or health care system experience
5. Which setting had the highest proportion of high-value projects?
   a. Community pharmacy
   b. Direct patient care settings
   c. Health system pharmacy
   d. Urban settings
6. Which project types were most frequent among community pharmacy rotations?
   a. MUEs and developing P&T committee materials
   b. Develop or update clinical guidelines or protocols and inservice/education presentation for clinical staff
   c. Expansion of current pharmacy services or updating materials and patient education
   d. Process improvement and business proposal
7. Which of the following is a suggestion for improving the selection of a practice development project that results in high-value to the site?
   a. Allow the student to choose

b. Ask upper management to assign the projects
c. Only choose project types designated as high-value from this analysis
d. Consider the pharmacy department strategic goals and create a board to identify and assign projects

8. Which of the following is a model that may increase the value of student projects, but also has evidence to suggest increased satisfaction with precepting?
a. Layered learning
b. Splitting larger APPE projects into smaller projects
c. Team precepting
d. Use of a collaborative practice agreement

9. Did the activity meet the stated learning objectives? (if you answer no, please email sarahs@pswi.org to explain)
a. Yes
b. No

10. On a scale of 1 – 10 (1-no impact; 10-strong impact), please rate how this program will impact the medication therapy management outcomes or safety of your patients.

11. On a scale of 1 – 10 (1-did not enhance; 10-greatly enhanced), please rate how this program enhanced your competence in the clinical areas covered.

12. On a scale of 1 – 10 (1-did not help; 10-great help), please rate how this program helped to build your management and leadership skills.

13. How useful was the educational material?
a. Very useful
b. Somewhat useful
c. Not useful

14. How effective were the learning methods used for this activity?
a. Very effective
b. Somewhat effective
c. Not effective

15. Learning assessment questions were appropriate.
a. Yes
b. No

16. Were the authors free from bias?
a. Yes
b. No

17. If you answered "no" to question 16, please comment (email info@pswi.org).

18. Please indicate the amount of time it took you to read the article and complete the assessment questions.

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