

COMMENTARY

Entrustable Professional Activities as a Novel Framework for Pharmacy Education

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Submitted January 4, 2017; accepted July 11, 2017; published June 2018.

Entrustable professional activities (EPAs) are units of measure for a particular profession that describe the professional's unique abilities and work. EPAs can be used in two ways: as a link between individual competencies for mastery and overall professional responsibilities in practice; and as a mechanism for faculty to assess the student's progression using levels of decreasing supervision. Currently used in medical education, implementation and utilization of EPAs within pharmacy education has potential benefits and challenges. This article will describe, highlight benefits of, and share mitigation strategies for implementing EPAs within pharmacy education.

Keywords: Entrustable professional activities, pharmacy education, medical education, assessment

INTRODUCTION

Entrustable professional activities (EPAs) are a unit of measure of the unique professional duties of a specific profession.¹⁻⁵ Originally, EPAs were born as a summation of discreet competencies that together compose a professional task.⁶ Competencies describe individual knowledge, attitude, and skill components that a student must master to be considered as capable of performing a complete activity.^{2,7}

In medical education, faculty members use EPAs in the education, training, and professional practice of students. EPAs provide support for students toward their future professional roles by presenting them with the work that shapes their professional identity and building a culture of self-reflection of their progress toward that professional role.

The adoption of EPAs in medical education grew out of the limitations of the Outcome Project and the subsequent Next Accreditation System (NAS).^{8,9} The Outcomes Project provided competency-based categories, which the NAS linked to markers of development for assessment that were abstract and not directly measurable in practice because they did not capture the full measure of an expected professional activity. EPAs have been devised for

physician specialties to support these competency-based assessment models and are currently being piloted within residency training programs, such as family medicine, pediatrics and internal medicine.^{10,11} These specialty areas (family medicine, pediatrics and internal medicine) have a similar breadth of practice as pharmacy, across many disease states and medications. Thus, the experience of EPAs within these specialties may provide insight and a common language for pharmacy education and training as overall and general EPAs are introduced.^{10,11} In addition, physician assistant groups are recognizing the value of EPAs and initializing conversations on how EPAs can help demonstrate the clinical preparedness of their graduates.¹²

EPAs strengthen and support interprofessional teamwork through delineated professional roles and responsibilities within a team.¹³ Additionally, the experience from medical education may enlighten pharmacy educators of anticipated barriers and successes and guide them to a smoother execution.

The 2016 Accreditation Council for Pharmacy Education (ACPE) Standards provide innovative, competency-based strategies for pharmacy that mirrors growth in the medical education model.¹⁴⁻¹⁶ Specifically, competency-based education of health professionals identifies a target of a minimal level of ability in one or more areas for a student.^{4,16} Competencies in this format are bite-sized, observable actions. For example, when students measure a patient's blood pressure, competencies that are observed

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in this process may include: selecting the appropriate cuff size, verifying appropriate body position of the patient, positioning and inflating the cuff to the correct pressure and so forth. Using competency-based education strategies ensures, through a checklist mechanism, that pharmacy students will be practice-ready for direct patient care at the completion of their PharmD program.^{14,17}

EPAs build on this competency-based format and can be used in two ways: as a link between individual competencies for mastery and overall professional responsibilities in practice, and as a mechanism for faculty to decide the level of supervision for a student.¹⁻⁵ The most recognized EPA of a pharmacist is the medication fulfillment process.

Consider the following vignette: A pharmacy student is on his/her first community Advanced Pharmacy Practice Experience (APPE) rotation. He/she has not practiced in a community pharmacy since an Introductory Pharmacy Practice Experience (IPPE), where he/she valued her direct patient care interactions. Now she is uncertain of her role and is nervous about meeting the faculty's expectation for anticipated patient encounters. Meanwhile, a 63-year-old female patient who was recently discharged from the hospital goes to the same community pharmacy where the pharmacy student works to fill her prescriptions. The patient was treated for her first congestive heart failure exacerbation. She has not consulted a physician in 15 years and is anxious about the medications she has been prescribed. As the faculty, how much of the medication fulfillment process (patient specific entry, determining if there are contraindications, identifying and managing drug interactions, and obtaining third-party billing) would you entrust to this pharmacy student? Would your level of entrustment change if the student was halfway through her APPEs or on her last APPE? In this vignette, the pharmacy student must master each

individual competency necessary to dispense a medication before being able to complete the EPA of fulfilling the medication order without supervision upon graduation. The relationship between competencies and EPAs is shown in Table 1. The objective of this review is to provide a practical understanding of EPAs as they pertain to pharmacy education and to describe mechanisms for the implementation of EPAs within the Doctor of Pharmacy curriculum.

Supervision, Entrustment and Competency-based Assessment

Assessment is central to the success of the competency-based education model. Table 2 describes the different levels of supervision that a pharmacy student may require. As the student progresses to each competency, his/her need for supervision with an overall task decreases (eg, obtaining a blood pressure reading, the medication fulfillment process).¹⁸ As the student's knowledge, attitudes and skills expand, he/she progresses from level to level in the didactic to practice-based settings with decreasing supervision until he/she can be completely entrusted by the faculty with a given task. By verifying each competency in a simple, categorical yes/no method, the faculty can feel confident that he/she knows where a student is to correctly assign and thus, entrust clinical tasks.

Learning, however, does not stop with entrustment. Additional levels of achievement in a professional career are obtained through experience or additional training.^{19,20} Figure 1 depicts the progression through an assessment construct, from "knowing" to "knowing how" to "showing how" to "doing," with applicable pharmacy education curricular activities corresponding to the student's competence and level of supervision.²¹ Students can progressively build their confidence by tangible achievement of competencies at each level in various curricular activities thereby increasing their self-efficacy.²²

Table 1. A Comparison of Competency and Entrustable Professional Activities

Competency ²⁸	Entrustable Professional Activity ²⁹
Specific, comprehensive, durable, trainable, measurable activities	A unique task performed by a professional
A specific, observable ability of a health professional that:	
1. Integrates multiple components such as knowledge, skills, values, and attitudes	1. Is part of essential professional work in a given context
2. Is lasting over time	2. Must require adequate knowledge, skill, and attitude
3. Is trainable	3. Must lead to recognized output of professional labor
4. Is measurable	4. Should be confined to qualified personnel
	5. Should be independently executable
	6. Should be executable within a timeframe
	7. Should be observable and measurable in its process and outcome (well done or not well done)
	8. Should reflect one or more competencies

Table 2. Levels of Supervision for a Pharmacy Learner^{3,4}

Level of Supervision	Learner/Supervision Description	Setting	Level of Entrustment
I	The learner has some knowledge, but is unclear how to operationalize that information. The learner is able to thoughtfully observe.	Introductory Pharmacy Practice Experience	Low
II	The learner has a broader knowledge and is able to perform rudimentary tasks with direct supervision and proactive correction.	Skills Lab, Simulation, Advance Pharmacy Practice Experience	Moderate
III	The learner has complete knowledge and is able to perform tasks necessary of their profession.	APPE, pharmacist in practice	High
IV	The learner has complete knowledge and unique clinical practice experience of complex populations and environments.	Seasoned pharmacist, PGY1/2 pharmacy resident	Complete
V	The learner has complete knowledge, unique clinical practice experience, and is engaged in a pharmacy educational program.	Faculty member, clinical pharmacy educator	Complete

Benefits of Using Entrustable Professional Activities (EPAs)

As an assessment tool, EPAs have potential benefits and growth opportunities for faculty and students. For pharmacy faculty, whether didactic educators or clinical preceptors, moving from current end-of-rotation/course summary assessments to ongoing, dynamic, in-the-moment assessment of students’ performance is necessary. This approach will require adjustment in faculty behavior to include this documentation. In addition to providing feedback to students, documenting their performance helps faculty members recognize their students’ ability, which then allows faculty to adjust their level of supervision accordingly. Using a real-world, tangible way to measure performance, instead of an abstract scale, increases the meaning of the assessment on both sides.²³ At the end of an APPE, faculty can use EPAs to evaluate a student with a finite yes/no simply by asking the question, “Can this student complete this task autonomously?” Thinking back to the vignette, faculty can use the medication fulfillment EPA to provide summative feedback and evaluation of the student. Implementation of EPAs will be challenging. Faculty development should be aimed at helping them calibrate

their assessments of by letting them practice evaluating examples of students at each level of entrustability.

Students will benefit from the use of EPAs as they provide a strong connection between classroom and practice, with students being able to discern how the curriculum prepared them for practice. EPA adoption can help students link their learning to real expectations and responsibilities of a pharmacist. EPAs are a mechanism for defining the abstract concept of professional identity so students can understand their role and responsibilities on the health care team in a tangible way.¹³ EPAs are highly specific through delineation of supporting tasks, which builds a student’s confidence through the checklist demonstration of tasks and increased personal self-worth with completion.²⁰ The medication fulfillment process from the vignette as an example has clear supporting tasks or competencies (patient specific entry, determining if there are contraindications, identifying and managing drug interactions, and obtaining third-party billing) that the student can understand. Communicating clear expectations for their actions empowers students to then reflect on their academic and clinical performance and direct their own learning. The continuous feedback provided

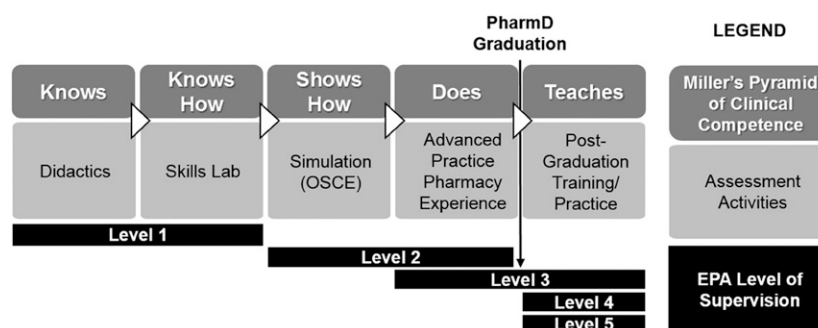


Figure 1. Framework for PharmD Development and EPA Level of Supervision²¹

through the EPA process can result in a safer and more collaborative learning environment.

Implementation Within the PharmD Curriculum

EPAs have the potential to ensure new PharmD graduates are practice-ready.¹⁷ ACPE has demonstrated forward-thinking by guiding programs to identify EPAs as they apply to the Center for the Advancement of Pharmacy Education's (CAPE) Educational Outcomes Standards 1-4.^{14,24} Approximately two years following the release of the 2016 ACPE Standards, the 2015-2016 American Association of Colleges of Pharmacy (AACCP) Academic Affairs Committee published 15 core EPAs essential for all pharmacists to perform without supervision as entrusted by stakeholder groups (Table 3).^{19,20} The EPAs identified by the committee are linked to current CAPE Education Outcomes, providing a roadmap for assessment of current curriculums.^{14,19,20} EPAs as a new assessment mechanism focused toward overall outcomes from professional practice supports the longstanding mission of liberalization of the professional curriculum toward an outcomes-based, assessment-guided curriculum.²⁵

Abandoning CAPE outcomes is not the intent of incorporating EPAs into the PharmD curriculum, but instead a broader term that subscribes tangible actions of a professional, an EPA, for other professionals and laypersons to understand. EPA utilization in the didactic and experiential components of the professional program, is important for pharmacy students to begin to explore their pharmacist identity while grounded in accepted descriptions of the profession.

Implementation in the Didactic Curriculum

Both novel and disrupting, implementation of EPAs within the classroom will necessitate strategic planning and preparation for success as an assessment of academic progression. Incorporation of EPAs into didactic courses encourages a move from traditional lecture to more active modes of learning in which students are able to practice applying the content to real-world examples. For example, EPAs can be incorporated into a therapeutics lecture to illuminate how a pharmacist uses his/her medication knowledge. An in-classroom, problem-based activity, where students can practice verbalizing their knowledge in a professional manner, can be easily facilitated and can improve student performance.²⁶ Additionally, EPAs can be integrated into laboratories or simulations designed for students to apply learned knowledge with skill development.

Given that didactic courses instruct, develop, reinforce, and assess skills, EPAs may be added to provide students with clear expectations for performance and as an assessment guide for faculty to evaluate student progress prior to entering the introductory and advanced experiential curriculum. EPAs can help students self-assess their progression to practice readiness. It is ideal to introduce and familiarize students with EPAs during their didactics to promote the skill of self-reflection early in their education and training. Faculty must consider which level of supervision is required for academic progression at the end of each term and professional year for the student to progress, particularly PharmD programs with longitudinal IPPE rotations throughout the academic, didactic

Table 3. Core Entrustable Professional Activities (EPAs) from the American Association of Colleges of Pharmacy²⁰

Core EPAs for Pharmacy Graduates

1. Collect information to identify a patient's medication-related problems and health-related needs.
2. Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.
3. Establish patient-centered goals and create a care plan for a patient in collaboration with the patient, caregiver(s), and other health professionals that is evidence-based and cost-effective.
4. Implement a care plan in collaboration with the patient, caregiver(s), and health professionals.
5. Follow-up and monitor a care plan.
6. Collaborate as a member of an interprofessional team.
7. Identify patients at risk for prevalent diseases in a population.
8. Minimize adverse drug events and medication errors.
9. Maximize the appropriate use of medication in a population.
10. Ensure that patients have been immunized against vaccine-preventable diseases.
11. Educate patients and professional colleagues regarding the appropriate use of medications.
12. Use evidence-based information to advance patient care.
13. Oversee the pharmacy operations for an assigned work shift.
14. Fulfill a medication order.
15. Create a written plan for continuous professional development.

semesters. Careful note must be taken to ensure EPAs are used in transforming time-focused curriculums to competency-based mechanisms, where levels are not linked to points in time of professional education, but rather the ability of a student to complete a competency.

Implementation in the Experiential Learning Curriculum

EPAs are a logical extension of competency-based expectations and easily adoptable by experienced pharmacy faculty. Students on IPPE and APPE rotations can directly observe the activities of their experiential faculty and begin emulating these skills in real time. Both components of EPAs, units of work and levels of entrustability, are already at the heart of experiential learning. Incorporating EPAs into existing experiential frameworks will not disrupt clinical practice but will only require additional focus on assessment.

As students hone their clinical skills and use their drug knowledge while on IPPE and APPE rotations, they can be assessed using the 15 core EPAs and levels of supervision (Tables 2 and 3).^{3,19,20} Students participating in IPPE rotations would have limited knowledge and skills (Level I) to observe and gain understanding during the experience. Students on APPE rotations should be more advanced (Level II-III) and thus, will practice performing individual EPA supporting tasks (or competencies) under the supervision of their faculty until the complete EPA can be performed and entrusted. Due to their fundamental nature, these 15 core EPAs can be used in any of the required experiential realms: institutional, community, acute care, and ambulatory care.^{19,20} Although some EPAs may be a better match with one of these four settings, by definition, all core EPAs can be applied to any setting and level in which the student completes experiential learning.

As an example, consider the EPA: “Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.” Supporting tasks for this EPA include: selecting laboratory tests, measuring an adult patient’s vital signs and interpreting results of both.^{19,20} On a community rotation, a pharmacy student would not typically have the capability to select laboratory testing with subsequent interpretation. However, the student would be able to obtain a patient’s blood pressure, heart rate, and respiratory rate and then interpret. Conversely, in acute care settings, a student could dutifully select laboratory results and interpret. Yet, procurement of vital signs in this setting would be designated to a nursing order. An ambulatory care experience would be ideally suited for all of these supporting tasks to be directly supervised and observed

for the faculty to assess the performance of the student toward the EPAs. When implementing EPAs within experiential learning, academic programs should be wary of requiring fewer than the core EPAs identified, and should not be deterred from assessing additional EPAs.

Similar to professional expectations when beginning new experiences, EPAs should be determined *a priori* and communicated to the student early. Although all core EPAs should be applicable to any pharmacy practice setting, different levels of supervision should be expected with different timelines within the experiential (IPPE and APPE) curriculum. During IPPE experiences, students will have limited knowledge, being early in their pharmacy education, and thus, will have low entrustability to observe or perform low-level tasks while learning how each EPA is operationalized in different settings. During APPE rotations, students on their first, second, or third experience may not be expected to master an EPA at level III due to early or limited experience, but minimally perform supporting task from each core EPA. In contrast, students nearing the end of their APPE rotations and anticipating graduation should be expected to achieve level III for all EPAs to meet the minimum requirements as recommended.^{19,20}

Applying this concept to the initial vignette, the student on his/her first APPE would be minimally entrustable with the medication fulfillment process. The faculty would need to provide significant supervision at each point in the medication fulfillment process (patient-specific entry, determining if there are contraindications, identifying and managing drug interactions, and obtaining third-party billing). However, if this student were on his/her final rotation, the faculty should be able to entrust the student with the medication fulfillment process under minimal, reactive supervision. For a moment, consider if this student were halfway through her APPE rotations. How should faculty members adjust their level of supervision based on the EPAs? Certain students will quickly perform core EPAs necessitating less supervision (Levels III and IV) sooner than their colleagues due to the rigor of pre-APPE curriculum experiences, internship experiences, and maturity level. Active participation of all APPE faculty to set clear and student-focused expectations is important. In conjunction to faculty engagement and EPA-based expectations, students will need to rely on their own self-assessment skills learned during the didactic portion of their education and be self-reflective with their progress within the EPAs to communicate their experiences at different entrustment levels. Using EPA-centered student reflections of progress and faculty direct observation, a faculty member can define more quickly

the level of supervision necessary for a student on an APPE rotation during the middle of the year.

EPA Personalization

In addition to the core EPAs identified by AACP, PharmD programs should consider where EPAs may be adapted and expanded to fit with their context. For example, some institutions may use additional EPAs for students wishing to personalize their education through elective coursework, dual degrees, or concentrated APPEs to enhance the core EPAs. One deployment is to add additional EPAs matching the aspects of a specific practice environment. For instance, students interested in independent pharmacy ownership may identify additional administrative EPAs, eg, establishing new patient care services, managing pharmacy inventory, to learn during a didactic elective and practice during an IPPE or APPE rotation. Alternatively, programs may specify higher levels of entrustability for students enrolled in experiences to prepare APPE students specifically for postgraduate residency training.²⁷ Each PharmD program should evaluate the role of personalization for their student population to determine the needs for additional EPAs. Specialized EPAs would be in addition to the core curricular EPAs as a limited experience and only available to students who have successfully demonstrated competence at a level 3 for all of the core curricular EPAs. As EPAs are developed in postgraduate pharmacy training, a roadmap for specialized EPAs will form to assist PharmD program administration with personalized EPA development.

With this existing framework for students pursuing PGY1 pharmacy residency training, elective APPE rotations in acute care settings can elevate their entrustability requirements for learning of specific tasks to intermittent supervision (Level IV).⁴ When formulating a plan that carries EPAs above general requirements, programs should also consider a development plan using key stakeholder feedback for activities reflecting the work of the environment and patient population. The same attention can be afforded for those students pursuing fellowship experiences post-graduation.

Translating EPAs to Traditional Grading Systems

An additional challenge to implementing EPAs within pharmacy education is how EPAs can be translated to traditional grading systems, ie pass/fail, letter grade. The AACP Academic Affairs Standing Committee recommends pharmacy graduates achieve a Level III (reactive supervision) for each of the 15 core EPAs upon graduation.^{19,20} This provides programs with an expectation of their students' performance level upon graduation, but offers little guidance for expectations as students

matriculate through the curriculum. Beginning with the end in mind, programs may develop intermittent progress checkpoints by working backwards from graduation to the first professional year, mapping progression from observation only (Level I) to reactive supervision (Level III).

EPAs are assessed by levels of supervision not by score, percentage, or letter grade as in traditional academic coursework. Programs should consider how EPAs can link to their current grading constructs. The connection between mastering a unit of work encompassing several competencies and pass/fail assessment may be most appropriate, using high stakes that mimic patient care. More obscure is how student achievement of EPAs per level of supervision can be translated into letter grading systems. One option is to include a letter grade translating to the number of EPAs that the student has successfully achieved at levels of supervision predetermined by the instructor.

Incorporating a new assessment strategy requires a remediation plan for when expectations are not met. APPEs have traditionally been assessed independently based on the unique knowledge, attitudes, and skills learned and practiced, considering only the one experience. However, when using EPAs that represent the profession regardless of setting or population complexity, rotational experiences become progressive for a student to progress collectively to a Level III. Thus, students may not be at a Level III, or competent, for all core EPAs at the end of each rotation as previous grading systems may have denoted. Each core EPA will need to be reassessed at each APPE rotation until the student reaches a Level III. APPE faculty should be vigilant of students who are not performing at their expected level at that point in their rotations and feel empowered to notify the PharmD program administration. Early identification of students who are not anticipated to reach a Level III over the course of their APPEs is critical for remediation success. PharmD programs should investigate what type of remediation plans would best suit their student population and the capabilities of their faculty. Remediation plans may include additional knowledge/skill gaining opportunities or rescheduling of their APPEs to build basic skills for more complex APPEs. Student achievement of EPAs may also help guide APPE selection. For example, students with limited experience with a particular EPA may be encouraged to select an APPE rich in that area early for exposure and application. A student with limited experience collaborating with other members of the interprofessional team may select a rotation at a patient-centered medical home where professionals work together for the benefit of the patient. Additionally, a student with limited exposure to vaccines, may select a community

pharmacy rotation where pharmacists have active roles in identification and provision of vaccines in compliance with federal, state, and local laws and regulations.

Mapping all 15 core EPAs to current curricular programs may be challenging. The core EPA from the Practice Manager Domain states, "Oversee the pharmacy operations for an assigned work shift."²⁰ While an important administrative function as a pharmacist, this operations EPA may not fit with the current design of APPEs offered. To ensure the EPA is addressed during the APPEs, the faculty and PharmD program coordinators must be open to curricular changes. The core EPA from the Self-Developer Domain states, "create a written plan for continuous professional development."²⁰ While any faculty member can address this EPA, a concerted effort must be emphasized to complete each supporting task: create and update curriculum vitae, résumé, and professional portfolio, perform a self-evaluation to identify professional strengths and areas needing improvement. This core EPA would be well placed not in a specific APPE, but timed during the fall term when students are preparing to apply to a residency, fellowship, or postgraduate position.

CONCLUSION

EPAs are a unique and innovative educational strategy emerging in pharmacy education. Using EPAs to guide the ongoing assessment of students can better focus teaching and build confidence in both faculty and students. It can also increase the meaning of each assessment in a tangible way. Where students may have been unsure of their expectations or progress, EPAs can provide them feedback on their journey toward mastery. Pharmacy educators can use EPAs to gauge the necessary degree of supervision. In using this novel educational strategy, the professional identity of a pharmacist is recognizable and functional for interprofessional collaboration and practice in the health care system.

ACKNOWLEDGMENTS

The authors would like to thank Nicholas Popovich, PhD, for his review and feedback during the editing of this manuscript.

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