Society of Medical Education & Research

2021, Volume 1, Page No: 123-130
ISSN: 3108-4850

Annals of Pharmacy Education, Safety, and Public Health Advocacy

Evaluating the Effect of Honors/Pass/Fail Grading on EPA-Based APPE Outcomes in Pharmacy Students

Ivan S. Volkov[1], Anna Petrova[1]*, Elena M. Smirnova[1], Yuri A. Kuznetsov[1], Olga V. Morozova[1]

[1]Department of Pharmaceutical Policy and Management, Faculty of Pharmacy, Saint Petersburg State University, Saint Petersburg, Russia.

***E-mail** ✉ anna.petrova@gmail.com

Abstract

This study retrospectively analyzed how transitioning from traditional letter grading (TLG) to an honors/pass/fail (HPFG) system affected pharmacy students' performance during Advanced Pharmacy Practice Experience (APPE) rotations, using evaluations based on entrustable professional activities (EPAs). Additionally, the research explores insights gained from shifting assessment methods from CAPE-based frameworks to EPA-focused experiential evaluations. A total of 6,679 student performance records were analyzed from two pharmacy colleges over a four-year span. In the first two years, both institutions assessed students using a CAPE-based APPE evaluation paired with traditional letter grades. During the subsequent two years, following the transition to EPA-based assessments, one college adopted an honors/pass/fail grading system, while the other continued with letter grading. Changes in performance scores between the pre- and post-implementation periods were examined to evaluate the effect of the grading change. Additionally, multiple linear regression was employed to investigate the influence of factors such as college, evaluation period, assessment type, rotation category, and grading system on student scores. The study also compared grade distributions across the two periods at both colleges.

The college that adopted the honors/pass/fail grading system showed a comparable decrease in student performance scores after the shift to EPA-based evaluations as the college that continued using traditional letter grades. Analysis using multiple linear regression revealed no statistically significant relationship between the grading system and performance scores, after accounting for institution, rotation type, and evaluation period. The adoption of HPFG did not seem to negatively affect student performance on APPE rotations at the college using EPA-based evaluations.

Keywords: EPAs, Grading, Experiential education, Letter grading, Pass/fail

Introduction

The evaluation of pharmacy students' abilities, both in the classroom and during experiential rotations, continues to evolve as a central focus in pharmacy education. Over the past decade, experiential assessments have grown in importance, initially shaped by the 2013 CAPE framework and later guided by the 2017 core Entrustable Professional Activities (EPAs) developed by the American Association of Colleges of Pharmacy (AACP) [1, 2]. In 2021, the Curricular Outcomes and Entrustable Professional Activities (COEPA) framework was introduced, combining updated EPAs with activity-based Educational Outcomes (EOs)—such as caregiver, provider, leader, and collaborator—that outline the expected competencies of new pharmacy graduates [3]. These COEPA EPAs were subsequently integrated into the Accreditation Council for Pharmacy Education's 2025 standards [4]. Although COEPA EPAs differ in some respects from the 2017 AACP EPAs, they can be aligned, as detailed in **Table 1**. To support curriculum development, the AACP Academic Affairs Committee released guidance in 2023 on applying COEPAs in both

Access this article online https://smerpub.com/

Received: 29 May 2021; **Accepted:** 03 September 2021

How to cite this article: Volkov IS, Petrova A, Smirnova EM, Kuznetsov YA, Morozova OV. Evaluating the Effect of Honors/Pass/Fail Grading on EPA-Based APPE Outcomes in Pharmacy Students. Ann Pharm Educ Saf Public Health Advocacy. 2021;1:123-30. https://doi.org/10.51847/OPt4vTQNyG

didactic and experiential education, stressing the need for research to establish best practices for EPA assessment in experiential settings [5].

Table 1. Core entrustable professional activities with mapping to COEPA AND APPE evaluations.

EPA	Core professional tasks that pharmacy graduates are expected to competently perform upon entering practice.	AmCare	AGM	Community	HHS	COEPA Mapping
	Domain: Direct Patient Care					
1.1	Gather patient information to identify medication-related issues and overall health needs	X	X	X	X	1
1.2	Evaluate patient data to determine effects of medications, recognize problems, and prioritize health concerns	X	X	X	X	2
1.3	Set patient-focused goals and create a care plan in collaboration with patients, caregivers, and healthcare team	X	X	X	X	3
1.4	Carry out the care plan with input from patients, caregivers, and other health professionals	X	X	X	X	6
1.5	Monitor and follow up on the effectiveness of the care plan	X	X	X	X	9
	Domain: Collaborative Teamwork in Healthcare					
2.1	Work effectively as a member of an interprofessional healthcare team	X	X	X	X	4
	Domain: Population Health and Medication Safety					
3.1	Identify patients at risk for common diseases in the community	X		X		12
3.2	Reduce medication errors and prevent adverse drug events	X	X	X	X	10
3.3	Promote safe and appropriate use of medications across a population	X	X	X	X	n/a
3.4	Ensure patients receive recommended vaccinations	X		X		12
	Domain: Medication Education and Evidence-Based Practice					
4.1	Educate patients and healthcare colleagues about correct medication use	X	X	X	X	8, 11
4.2	Apply evidence-based information to improve patient care	X	X	X	X	5
	Domain: Pharmacy Operations and Management					
5.1	Manage pharmacy operations during assigned work shifts			X	X	13
5.2	Accurately dispense and fulfill medication orders			X	X	7
	Domain: Continuous Professional Growth					
6.1	Participate in ongoing professional development activities	X	X	X	X	EO 3.1

Abbreviations: AACP – Colleges of Pharmacy, Association of American; AGM – General/Acute Medicine; AmCare – Care, Ambulatory; APPE – Pharmacy Practice Experiences, Advanced; COEPA – Entrustable Professional Activities and Curricular Outcomes; EO – Outcome, Educational; HHS – Health System/Hospital; n/a – Applicable, Not

Although medical schools have been using EPA-based evaluations for students since at least 2014, there is limited literature describing specific strategies for assessing EPAs [6, 7]. A key consideration in implementing EPA-based assessments is how to document students' entrustability and readiness for

progression through the curriculum. Schools that have adopted EPA-based evaluations often rely on entrustability cut-points that align more closely with pass/fail grading (PFG) rather than traditional letter grading (TLG). In recent years, U.S. medical schools have increasingly adopted PFG over TLG, and as of 2021, 16% of medical schools reported using PFG across all required clinical clerkships [8].

Research in both educational and clinical contexts supports PFG, as it is associated with reduced student stress, enhanced collaboration, and improved self-regulation, without negatively affecting motivation or performance [9–11]. In contrast, TLG systems may present challenges in accuracy and validity, while potentially reducing student coping, self-efficacy, resilience, social support, and performance [9, 12, 13]. Direct comparisons of PFG and TLG in healthcare education are limited. A 1975 study of dental students found no significant differences in exam performance between TLG and PFG [14]. Another study comparing Honors/Pass/Fail grading (HPFG) to letter grading found higher GPAs under letter grading in a didactic course, though national board scores were unaffected [15]. Overall, research in medical education suggests objective academic performance is comparable across grading schemes, but evidence in pharmacy education remains limited [12, 16–19].

These findings help contextualize the 2022–2023 AACP Academic Affairs Committee's recommendation to consider PFG for EPA assessments. The rationale included concerns that TLG may lead students to prioritize grades over skill development, potentially causing grade inflation [5]. However, the committee did not provide direct evidence supporting this recommendation. Diverse perspectives exist within the Academy regarding PFG adoption. In this study, the two participating Colleges of Pharmacy (COPs) chose different grading approaches for APPE EPA-based evaluations: COP 1 adopted an HPFG system when transitioning from CAPE-based to EPA-based evaluations, while COP 2 maintained a TLG system. COP 2 cited concerns that eliminating letter grades could reduce student motivation and performance, limit the ability to officially recognize "Honors" on transcripts, and affect residency competitiveness and GPA calculations due to typically higher APPE grades.

Therefore, this retrospective observational study aimed to explore the impact of HPFG versus TLG on student rotation performance as assessed by APPE preceptors using RSPS. Additionally, because the HPFG implementation coincided with the transition from CAPE-based to EPA-based assessments, this study also provides insights into the effects of transitioning between these assessment frameworks.

Materials and Methods

Two publicly funded Colleges of Pharmacy (COPs) participating in a joint experiential program, with shared rotation offerings and identical APPE evaluation tools, simultaneously transitioned from CAPE-based to AACP EPA-based APPE evaluations. Before this transition, preceptor surveys guided which EPAs were appropriate to assess for each rotation type (e.g., Ambulatory Care vs. Community), as detailed in **Table 1**. Although the evaluation rubric wording changed slightly—shifting from assessing achievement of learning objectives at varying levels of supervision and independence in CAPE-based evaluations (years 1–2) to assessing entrustability at comparable levels in EPA-based evaluations (years 3–4)—both systems relied on a similar five-point scale to produce a raw student performance score (RSPS) for each rotation. The entrustability rubric was adapted from the limited pharmacy literature available at the time and was modeled on rubrics used in medical education [2, 6, 20].

Throughout the study period, both COPs derived final rotation grades from the RSPS. In the shared electronic rotation management system, RSPS scores were translated into either an HPFG at COP 1 or a TLG at COP 2. Grades were assigned using predetermined, rotation-specific RSPS thresholds (e.g., Honors/Pass/Fail at COP 1; A, B+, B, C+, C, D+, D, F at COP 2). The pass/fail threshold was standardized for both institutions, set to correspond to an RSPS reflecting a minimum entrustability score of 3 on at least 75% of assessed EPAs. At COP 2, maintaining a TLG system, this threshold represented the cutoff between a "C" and "D+," with other letter grades assigned via linear interpolation. For instance, for acute/general medicine rotations at COP 2, an RSPS ≥3.48 earned an "A," 3.23–3.47 a B+, 2.97–3.22 a B, 2.71–2.97 a C+, 2.54–2.70 a C, and any score below 2.54 resulted in a failing grade (D+, D, or F). The RSPS of 2.54 also served as the pass/fail cutoff for COP 1's HPFG system.

In addition to the RSPS, COP 1 students could earn an "Honors" designation through a separate Honors Eligibility – Final Performance/Professionalism

Evaluation, which assessed six areas: knowledge, patient care skills, approach to pharmacy practice, communication, engagement, and professionalism. Students exceeding a pre-established threshold—based on prior rubrics from the medical college—received Honors. Importantly, this evaluation was separate from the APPE evaluation and was not included in the RSPS, ensuring comparability of RSPS data between the two COPs. These Honors evaluations were therefore excluded from analysis.

Following Institutional Review Board approval, RSPS data were collected for all APPEs completed over four years. Years 1–2 included CAPE-based evaluations, providing baseline RSPS data for comparison. During years 3–4, COP 1 implemented HPFG alongside EPA-based evaluations, while COP 2 retained TLG with EPA-based evaluations. Statistical analyses included a general linear model to assess whether RSPS changes between years 1–2 and 3–4 differed significantly by institution, controlling for institution, timeframe, and their interaction. Multiple linear regression examined the impact of grading system (TLG vs. HPFG) on RSPS while adjusting for COP, evaluation type (CAPE vs EPA), rotation category, and timeframe. Least squares means and the Tukey procedure assessed significant differences, and an interaction term evaluated whether combined changes in grading system and evaluation type affected outcomes.

At COP 2, APPE preceptors directly assigned RSPS and corresponding letter grades. For COP 1, HPFG-based RSPS scores were retrospectively converted into TLG-equivalent grades using COP 2's RSPS thresholds. Associations between grading system and the prevalence of assigned or coded letter grades were assessed using contingency tables. The Mantel-Haenszel χ^2 test evaluated grade-specific differences, with Fisher's exact test applied when data were sparse (e.g., D, D+, F). Bonferroni correction was applied to maintain an overall alpha of 0.05, resulting in a significance threshold of 0.004.

Results and Discussion

A total of 6,679 APPE evaluations were reviewed, with 2,911 originating from COP 1 and 3,768 from COP 2. Both colleges demonstrated a significant reduction in RSPS following the switch to EPA-based evaluations during years 3–4, compared to scores obtained under CAPE-based evaluations in years 1–2 ($p < .05$ for both institutions). **Table 2** illustrates that the decrease in RSPS was slightly less pronounced at COP 1 after implementing HPFG with EPA evaluations, yet the overall decline was similar to that observed at COP 2, which continued using TLG during its transition to EPA-based assessments. Statistical analysis indicated that the difference in RSPS reduction between the two institutions was not significant ($p = .453$).

Table 2. Average changes in raw student performance scores following implementation of EPA-based evaluations and grading system modifications.

Timeframe	**Y 1-2**		**Y 3-4**	
# Evaluations	(n = 3295)		(n = 3384)	
Evaluation type	CAPE Outcomes-based		EPA/CAPE for Non-Pt Care	
Grading system	TLG		HPFG	TLG
College of Pharmacy (COP)	COP 1(n = 1404)	COP 2 (n = 1891)	COP 1(n = 1507)	COP 2(n = 1877)
Δ Mean RSPS vs baseline (y 1–2)	-	-	−0.15 (−3.3%)	−0.16 (−3.5%)
Mean RSPS	4.48	4.57	4.33	4.41
p-Value for Δ Mean RSPS vs baseline			p =.4531	

Abbreviations: #, college of pharmacy, number of; COP; EPA, entrustable professional activity; CAPE, Center for the Advancement of Pharmacy Education; Pt, patient; HPFG, pass/ honors/fail grading; TLG, traditional letter grading; RSPS, raw student performance score.

The multiple linear regression showed that RSPS scores were significantly influenced by the COP, the type of evaluation, the rotation category, and the timeframe of assessment (p-values provided in **(Table 3)**). In contrast, after accounting for these factors, the grading system (TLG versus HPFG) did not have a significant impact on RSPS. An additional test for an interaction between grading system and evaluation type was conducted, which also proved non-significant ($p = .742$). This indicates that there is no meaningful combined effect between grading system and evaluation type, and

evaluating the effect of the grading system alone is sufficient without performing subgroup analyses.

Table 3. Contingency table: comparison of TLG and TLG-equivalent grades across grading systems.

Grading System	Grade Assigned Directly by TLG or TLG-Equivalent for HPFG	A n (%)	B n (%)	B+ n (%)	C n (%)	C+ n (%)	D n (%)	D+ n (%)	F n (%)	Totals
TLG (Both COPs)		4,637 (89.70)	146 (2.82)	323 (6.25)	1 (0.02)	50 (0.97)	0 (0)	4 (0.08)	11 (0.21)	5,172 (77.44)
HPFG (COP 1)		1,321 (87.66)	76 (5.04)	68 (4.51)	13 (0.86)	27 (1.79)	0 (0)	0 (0)	2 (0.13)	1,507 (22.56)
Totals		5,958 (89.2)	222 (3.32)	391 (5.85)	14 (0.21)	77 (1.15)	0 (0)	4 (0.06)	13 (0.19)	6,679 (100)

Abbreviations: TLG, traditional letter grading; HPFG, honors/pass/fail grading; COP, college of pharmacy.

Analysis of the contingency table ($p = 0.075$) indicated that there were no significant relationships between grading method (HPFG vs. TLG) and the distribution of letter grades or their coded equivalents. Over the full study period, the prevalence of specific grades (D, F, C, D+, C+, B, B+, or A) was similar between the 5172 rotations graded with TLG and the 1507 rotations graded with HPFG, as shown in **Table 3**.

A closer examination of how grade distributions changed between the first two years versus the last two years, separated by College of Pharmacy (COP), is presented in **Table 4**. At COP 1, which switched to HPFG in years 3–4, significant changes included a rise in TLG-equivalent A grades, a drop in B+ grades, and an increase in C grades, while other grade categories remained largely unchanged compared to baseline/CAPE data. COP 2, which continued with TLG, showed a decrease in B+ grades and an increase in C+ grades over the same period, with no significant changes in the other letter grades.

During years 3–4 at COP 1, the mean RSPS for the "Honors Pass" designation was 4.74, slightly higher than the mean RSPS of 4.5 for the top "A" grade at COP 2. In that timeframe, 547 rotations (36.3%) at COP 1 received an "Honors Pass," whereas 1739 rotations (92.6%) at COP 2 were awarded an "A." Of note, six "Honors Pass" evaluations at COP 1 did not correspond to a TLG-equivalent "A": three aligned with a "B" and three with a "B+." **Table 5** summarizes the distribution of Pass, Honors Pass, and Fail grades alongside their TLG-equivalent grades.

Table 4. Specifically illustrates the prevalence of letter grades or coded TLG equivalents across the two COPs.

Grade Category	Institution	Years 3–4	Years 1–2	p-value	% Change
A	COP 1	1321 (87.7%)	1165 (83.0%)	.002	+4.7%
	COP 2	1739 (92.6%)	1733 (91.6%)	.252	+1.0%
B	COP 1	76 (5.0%)	53 (3.8%)	.097	+1.2%
	COP 2	52 (2.8%)	41 (2.2%)	.234	+0.6%
B+	COP 1	68 (4.5%)	157 (11.2%)	<.001	−6.7%
	COP 2	60 (3.2%)	106 (5.6%)	.0003	−2.4%
C	COP 1	11 (0.7%)	0 (0%)	.001	+0.7%
	COP 2	1 (0.1%)	0 (0%)	.498	+0.1%
C+	COP 1	27 (1.8%)	21 (1.5%)	.531	+0.3%
	COP 2	20 (1.1%)	9 (0.5%)	.0003	+0.6%
Fail (D+, D, F)	COP 1	4 (0.3%)	8 (0.6%)	.200	−0.3%
	COP 2	5 (0.3%)	0 (0%)	.287	+0.3%

Abbreviations: TLG, traditional letter grading; COP, college of pharmacy.
In this table, coded TLG-equivalent grades are shown in italics.

[a] The p-values were calculated using either the χ^2 test or Fisher's exact test, with a Bonferroni correction applied to maintain an overall family-wise error rate of 0.05.
[b] Changes that met the Bonferroni-adjusted significance threshold of 0.004 are considered statistically significant.

Table 5. Presents a detailed summary of RSPS scores corresponding to each assigned TLG grade or its coded TLG-equivalent for years 3–4.

Grade	COP 2 Assigned TLG	COP 1 TLG-Equivalent
A	4.49 (n = 1739)	Honors Pass (n = 541): 4.75Pass (n = 780): 4.32Overall (n = 1321): 4.50
B	3.18 (n = 52)	Honors Pass (n = 3): 3.06Pass (n = 73): 3.12Overall (n = 76): 3.11
B+	3.42 (n = 60)	Honors Pass (n = 3): 3.42Pass (n = 65): 3.39Overall (n = 68): 3.39
C	2.70 (n = 1)	Pass (n = 11): 2.73
C+	2.89 (n = 20)	Pass (n = 27): 2.90
Fail (D+, D, F)	2.42 (n = 5)	Fail (n = 4): 2.00

Abbreviations: TLG, traditional letter grade; RSPS, raw student performance score; COP, college of pharmacy.

Following the introduction of an HPFG system at COP 1, compared with the continuation of TLG at COP 2, no statistically significant differences were observed in student performance changes from baseline after both institutions moved from CAPE-based to EPA-based evaluations. Although mean RSPS scores during years 3–4 appeared lower at COP 1—the period in which HPFG was used—this trend was already present during years 1–2. Therefore, the decline cannot be directly attributed to switching from TLG to HPFG. Both institutions experienced a similar percentage decline in RSPS over the two years following the CAPE-to-EPA transition, suggesting that the reduction may be linked to the evaluation system change, an overall performance trend, the separation of COP 1 and COP 2 into independently accredited colleges, or other external factors.

First-time pass rates for the NAPLEX® mirrored this pattern. Initially, both COPs achieved rates of approximately 93–97% (national: 89.5% and 87%) in years 1–2. During years 3–4, COP 1 pass rates were 93.5% and 90%, and COP 2 rates were 88% and 79% (national: 87% and 84%). Similar trends were observed in MPJE® pass rates, with COP 1 at 88% and 79%, COP 2 at 90% and 83%, and national rates at 83% and 80% in years 3–4 [21–23]. Multiple linear regression analyses confirmed that the grading system was not associated with performance declines, even when adjusting for COP, evaluation type, rotation category, and timeframe. Collectively, these findings indicate that transitioning to HPFG did not negatively affect APPE performance.

Analysis of grade distributions across the study period revealed no overall association between grading method and grade prevalence. However, at COP 1, grade shifts occurred in both directions, with increases in both higher grades (coded TLG-equivalent "A"s) and lower grades ("C"s). COP 2, maintaining TLG, experienced only modest shifts toward lower grades, primarily from "B+" to "C+." These multidirectional changes at COP 1 may explain why some interinstitutional differences were statistically significant despite the lack of an overall association. Students earning an Honors designation at COP 1 had a mean RSPS of 4.74, compared to 4.5 for the top "A" grade at COP 2 during the same period, suggesting that HPFG may better differentiate top-performing students from their peers.

While this study addresses faculty concerns regarding potential reductions in student performance due to HPFG implementation, it does not evaluate all concerns, such as residency match outcomes. Prior research has shown that APPEs using pass/fail grading do not harm residency placement [24, 25]. At COP 1, residency match rates declined slightly in years 3–4 but remained above national averages. Lower pre-APPE GPAs in these years may have contributed, indicating that other factors beyond the grading system may influence outcomes.

Strengths of this study include its large sample size and four-year span across two institutions. Limitations include its retrospective nature and concurrent experiential assessment changes, which may introduce confounding variables. For example, COP 1 and COP 2 shifted from shared to independent accreditation, and the COVID-19 pandemic coincided with the introduction of EPA-based evaluations. These external factors could not be fully controlled or assessed. Additionally, implementing HPFG may be challenging at other institutions, particularly those that cannot assign grade

qualifiers like “Honors.” While our data support HPFG, it is unclear whether similar results would be observed in institutions limited to standard pass/fail grading. Further research is needed to examine HPFG’s broader impacts, including on residency placement, and to validate these findings at other institutions implementing PFG or HPFG for EPA-based assessments, in alignment with AACP guidance encouraging PFG for experiential education [5].

Conclusion

After simultaneously adopting EPA-based evaluations, no significant differences in student APPE performance declines were observed between COP 1 (HPFG) and COP 2 (TLG). Regression analyses indicated significant associations between RSPS and rotation type, COP enrollment, evaluation type, and timeframe, but no relationship with grading system. Within this dataset, HPFG implementation did not adversely affect APPE performance metrics.

Acknowledgments: None

Conflict of Interest: None

Financial Support: None

Ethics Statement: None

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